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IC-F50V Series Sales Handbook

Icom Inc.

FOREWORD and DISCLAIMER

Foreword

This handbook is prepared to provide detailed information about the IC-F50V series VHF HANDHELD TRANSCEIVERS.
NOTE: UHF versions will be released later.

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The information in this document has been carefully checked, and is believed to be correct and accurate. However, Icom assumes no responsibility for inaccuracies or mistakes. Furthermore, Icom reserves the right to make changes to any of the products described in this handbook without notice or obligation. The systems and applications described herein are for information and reference purposes only.

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1 Introduction
1-1 Company Profile

Company Profile

Icom, the wireless communication experts

Icom Inc. is a company located in Osaka, Japan, and is a manufacturer of wireless communication products. Since Icom's establishment in 1954, we have had a long record as a trusted manufacturer of land mobile radio, amateur radio, marine radio, navigation products, aviation radio and communications receivers.

Quality & Reliability

Icom quality and Icom reliability

Over 50 years of engineering and production excellence is a part of every Icom product. Using the latest equipment, Icom radios are tested to pass rigorous in-house tests as well as environmental tests to the US Military standard 810 specifications. Icom Inc holds ISO9001:2000 certification.

Production

Made in Japan quality

Icom is a rare example of an electronics manufacturer that has not shifted production to lower cost countries, but kept its production base 100% in Japan. The Wakayama Icom plant has an advanced production system to produce small volume/multi-model wireless communication products.

Icom brand

Icom, world brand name

Icom is today recognized as a reliable 2-way radio brand name around the world. Our land mobile radios are used by many professional organizations all over the world, like the United States Department of Defense and the U.S. Marine Corps. who chose Icom as the first Japanese company to supply radios to them.

Network

Icom's worldwide network

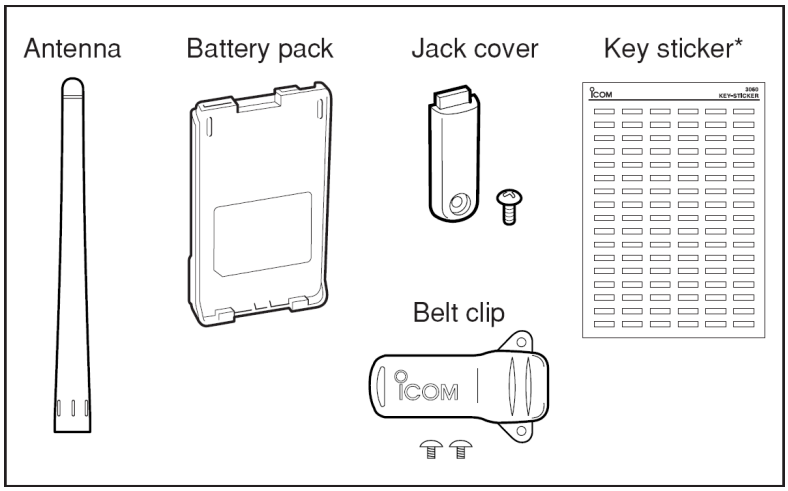
Icom's products are sold in over 80 countries in the World. Icom has an international sales and service network around the world, including sales subsidiaries in the US, Australia, Germany, Spain and liaison offices in France and China. Icom is here to support and service our products and your communication needs.

VHF Handheld Transceivers

IC-F50V

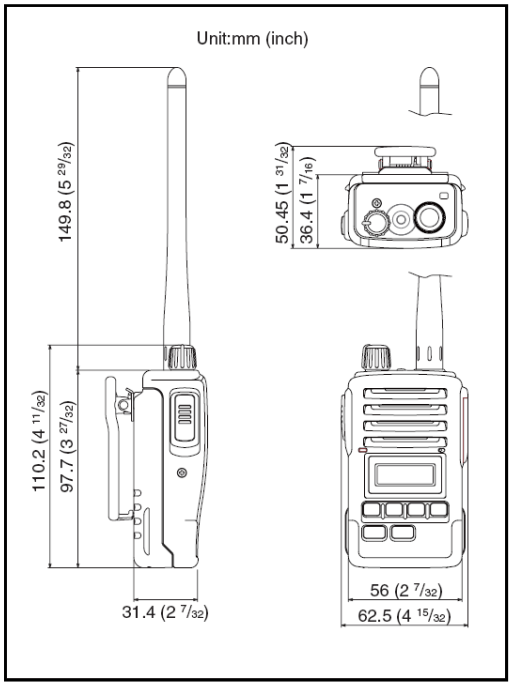
Supplied Accessories

(May differ according to version)



*There are no names on the programmable function keys since the functions can be freely assigned to [P0] to [P3], [Red], [▼] and [▲] keys.
Attach the supplied key stickers above the appropriate keys for easy recognition of that key's assigned function.

Dimensions



Never miss a call; Loud audio, vibration alert and voice recorder!

Firefighters, police, security and public utilities. Each profession has its own unique challenges, but all have one thing in common: the need for reliable communications. The IC-F50V series offers a compact waterproof package that is easy to use. This radio keeps you in contact in nearly any environment.

Vibration alert function

Program the radio to vibrate when user receives a pre-programmed 2-tone/5-tone code or call from a specific user (in MDC mode only). Great feature when you are in a meeting or noisy place.

8 minute voice recorder

When a pre-programmed 2-tone/5-tone code or a SelCall (MDC mode only) is received, the voice recorder automatically starts recording the incoming message. You will not miss an important call even when you are temporarily away from radio. You can manually start recording incoming calls and also your own message. It records up to a maximum of 8 minute (Or up to 48 calls of 10 sec. recording time).

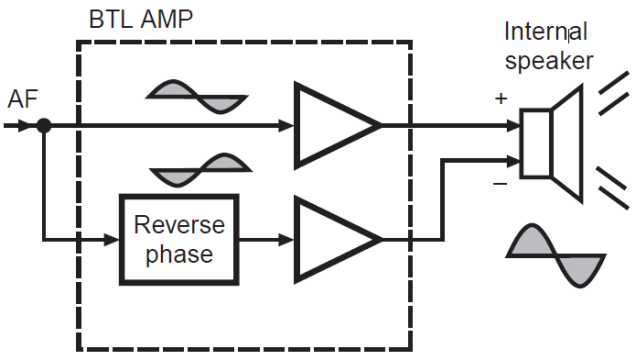
"✳" icon on the display shows you have a new message.

700mW audio output

The IC-F50V delivers a loud 700mW* audio output with built-in BTL amp. The built-in audio compander provides clear, low noise communications. Improved bass characteristics also betters the audio quality.
*Typical with internal speaker.

BTL only version (no vibration alert and no voice recorder), BTL/Vibration alert version (no voice recorder) * and BTL/Vibration alert/Voice recorder version available.

* Not available in some countries (Not available in the U.S.)



Lone worker function for remote check in

When the radio is not operated for preset period (1 to 255 min.), the radio sounds a beep and requires you to push any key to stop the beep and emergency transmission. If a key is not pushed for a preset time (1 to 255 sec.), an emergency signal automatically transmits and informs your co-worker or dispatcher that something may have happened to the individual worker.

IP67, dust-tight and waterproof protection

The IC-F50V has outstanding protection against dust and water that is equivalent to IP67. The IC-F50V can withstand submersion in 1m depth of water for up to 30 minutes and has dust-tight construction that prevents the ingress of dust.

Most popular signalings built-in

Use the built-in CTCSS, DTCS, 2-Tone, 5-Tone and MDC signaling capabilities to set up your talk group or selective calling. The IC-F50V can decode ten 2-Tone codes or eight 5-Tone codes on a channel. When a matched tone is received, the following actions are programmable for each code.

- Bell icon
- Answer back call
- Beep sound
- Auto TX
- Radio Stun/Kill/Revive
- Voice recorder
- Vibration alert

MDC 1200 Compatible

The following selective calling and ANI features are available with the built-in MDC signaling.

- PTT ID
- Radio check
- Caller ID
- Call alert
- SelCall
- Emergency, emergency mic monitoring
- 500 Aliases
- Status/message
- Radio stun/revive

BIIS 1200 Compatible

The following selective calling and data features are available with the BIIS system.

- 32 abbreviated call memories
- 7 group IDs
- 24-status Messages
- 8-character SDM (Short Data Message)
- RS-232C interface
- Position data transmission with a GPS

Common Features

Mode dependent scan

In the mode dependent setting, the scanning setting is dependent on the operating channel. When you change the operating channel, the scanning list automatically changes to the operating channel setting. It is convenient when you move to different operating area and change an operating channel setting.

Enhanced scanning

The Tx channel while scanning can be programmed per scanning list. The talk back function allows you to transmit on the channel detected after scanning resumes after a preset time, prior to the Tx channel setting. The nuisance delete function temporarily deletes a busy channel from the scanning list. Backlight at stop scan automatically turns on the LCD backlight when the scan stops.

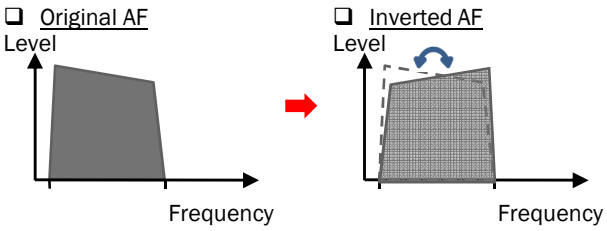
Lithium-Ion battery pack

The supplied 1700mAh Li-Ion battery pack, BP-227, provides a practical 10 hours* of operating time. The optional battery case BP-226 provides a convenient back up and great reassurance in an emergency. BP-226 is water-resistant, equivalent to IPX4.

* Typical operation Tx: Rx: Stand-by=5:5:90, power save on

Built-in inversion type* voice scrambler

This is the scrambling system which is built-in inversion type voice scrambler inverts the high and low audio frequencies.



* Inversion type voice scrambler is not compatible with UT-109/UT-110 voice scrambler. UT-109/UT110 cannot be physically installed into the IC-F50V.

Compact body

56(W) × 97(H) × 36.4(D) mm* compact body with durable, dependable construction, has been tested to MIL standard specifications.

*$2^{7}/_{32}$(W)x$3^{13}/_{16}$(H)x$1^{7}/_{16}$(D) in

The **MIL-STD-810** series of standards are issued by the United States Army's Developmental Test Command, to specify various environmental tests to prove that equipment qualified to the standard will survive in the field. **Icom** makes rugged products that have been tested to and passed the following MIL-STD requirements and strict environmental standards.

Standard	MIL 810C		MIL 810D		MIL 810E		MIL 810F	
	Method	Proc.	Method	Proc.	Method	Proc.	Method	Proc.
Low Pressure	500.1	I	500.2	I, II	500.3	I, II	500.4	I, II
High Temp.	501.1	I	501.2	I, II	501.3	I, II	501.4	I, II
Low Temp.	502.1	I	502.2	I, II	502.3	I, II	502.4-3	I, II
Temp. Shock	503.1	I	503.2	I	503.3	I	503.4	I
Solar Radiation	505.1	I	505.2	I	505.3	I	505.4	I
Rain Blowing/Drip	506.1	I, II	506.2	I, II	506.3	I, II	506.4	I, III
Humidity	507.1	I, II	507.2	II, III	507.3	II, III	507.4	–
Salt Fog	509.1	I	509.2	I	509.3	I	509.4	–
Dust Blowing	510.1	I	510.2	I	510.3	I	510.4	I
Vibration	514.2	VIII, X	514.3	I	514.4	I	514.5	I
Shock	516.2	I, II, V	516.3	I, IV	516.4	I, IV	516.5	I, IV

Other features

- 128 memory channels with 8 zones
- Optional VOX headsets available
- Optional GPS speaker-microphone
- Power on password
- Radio stun/kill/revive
- 8 DTMF autodial
- Normal and priority scans
- 2 step power saver and 2-step low battery beep
- Busy, repeater lockout functions and more.....

2-3 IP Classification Codes

A simple explanation of the IP rating system is written below. Please refer to more specialized information material if you wish to know more.

International Standard IEC 60529 outlines an international classification system that describes the sealing characteristics of electrical equipment. The classification system defines the level of protection provided by enclosures to prevent the ingress of foreign objects and moisture into the electrical equipment.

The classification system uses the “IP” code, or “Ingress Protection” code, to define the level of seal.

An IP number contains two numbers (i.e. IP67) in most instances which relate to the level of protection provided by an enclosure or housing. Either number may be shown as “X” (i.e. IPX6 / IP7X) to indicate the “X” part is not tested.

IP 6 7

Code letters

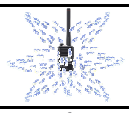
1st Digit

2nd Digit

Degrees of Protection (Foreign Bodies) – 1st Digit

IP Level	Description of Protection Level
0	Not protected
1	Protected against foreign solid objects of 50 mm diameter and greater (Protect a large surface of the body, such as the back of a hand)
2	Protected against foreign solid objects of 12.5 mm diameter and greater (Protect fingers or similar objects)
3	Protected against foreign solid objects of 2.5 mm diameter and greater (Protect Tools, thick wires, etc.)
4	Protected against foreign solid objects of 1.0 mm diameter and greater (Protect Most wires, screws, etc.)
5	Protected from the amount of dust that would interfere with normal operation
6	Dust tight (No ingress of dust; complete protection against contact)

Degrees of Protection (Moisture) – 2nd Digit

IP Level	Description of Protection Level
0	Not protected
1	Protected against vertically falling water drops
2	Protected against vertically falling water drops when enclosure is tilted up to 15°
3	Protected against water sprayed at an angle up to 60° on either side of the vertical
4	Protected against water splashed against the component from any direction 
5	Protected against water projected in jets from any direction
6	Protected against water projected in powerful jets from any direction
7	Protected against temporary immersion in water between 15cm and 1m for 30min.
8	Protected against continuous immersion in water, or as specified by the user

2-4 Key Features of MDC 1200 Signalling

The MDC 1200 signaling system enhances your transceiver's capabilities. It allows PTT ID, Selective Calling, Call Alert, Radio Check, Messaging and Emergency signaling. Also, the dispatcher can stun and revive transceivers on the system.
An additional feature of MDC 1200 system found in Icom transceivers is called aliasing. Each transceiver on the system has a unique ID number. Aliasing allows the substitution of an alphanumeric name for this ID number. For transmit, you can use this alias to select a transceiver to call. For receive, the alias of the calling station is displayed instead of the ID.

What is MDC 1200?

MDC 1200 is a signalling protocol developed by Motorola. The protocol allows users to send and receive short status messages as well as messaging updates.

The 1200 in the MDC 1200 name signifies that data is transmitted at the high speed rate of 1200 bits per second (Baud) MSK modulation.

MDC signalling is generally managed from a remote transmitter environment such as Police or Fire dispatch console.

MDC adds advanced digital features such as PTT ID, Selective Call and Radio Check, etc. to a basic conventional radio.

Key Features

➢ Receiving a call

When an **individual call** is received;
- The calling station alias and "SELCALL" are displayed alternately.

When a **Call Alert** is received;
- The calling station alias and "CALLALRT" are displayed alternately.

When an **emergency call** is received;
- The calling station alias and "EMG EMG" are displayed alternately.

Stun and Revive

The dispatcher can send MDC 1200 system signals that will stun or revive your transceiver. If a Stun command is received that matches your station ID, the transceiver will display "SORRY" and you can not receive or transmit. When a Revive command is received that matches your station ID, normal operation is restored.

Transmitting a Call

Transmitting a Selective Call

Selective calling allows you to make a call to a specific station or to a particular group. Other MDC 1200 system transceivers on the channel will not receive a selective call that does not match their station or group ID's.

Transmitting a Call Alert

Call Alert allows you to notify another user who may be away from the transceiver that you want to talk.

Transmitting a Radio Check Call

Radio check call allows you to determine whether another transceiver is turned on, within range and on channel without requiring any action from the targeted station user.

Transmitting a Status Message

Status Messaging allows you to send a pre-programmed status message to the dispatcher. There are 16 status codes that can be sent. In addition, the dispatcher can send an MDC 1200 system signal that causes the transceiver to automatically transmit its current status.

Transmitting a Message

The transceiver can send a pre-programmed message (up to 8- character) to the dispatcher. There are 16 messages that can be sent on a channel.

PTTID Calls

The transceiver can send an MDC 1200 system signal that includes PTTID when [PTT] is pushed (beginning of transmission) and released (end of transmission). If a PTTID call is received, the transceiver will display the calling station ID (or alias), emit a beep or vibrate.*
The details of the vibration function are described in the instruction manual.
*Depends on the pre-setting.

Emergency Calls

The MDC 1200 system Emergency feature can be accessed using the [Emergency] key (described in the instruction manual.) The transceiver will repeatedly send an Emergency MDC 1200 system command for a programmed length of time until it receives an acknowledgement signal.

The emergency call can be transmitted without a beep emission and LCD indication change depends on the setting.
With MDC 1200 system Emergency, the transceiver can also be programmed to keep the microphone open during an emergency call, allowing monitoring of the situation.

MDC 1200 Signalling Features

The features listed below are the functions of the MDC 1200 system, however some of them are not available for IC-F50V series (As marked in RED.).

Feature	Function	Benefit
PTT ID	The radio sends own ID informing everyone on the system when the PTT button is pushed/ released.	Allows the dispatch and other units to know who is calling. Easily identifies callers in noisy environments as the radio notifies that user who transmitted. Use with the alias table to assign text names for easy identification.
Alias Table	Use this feature for both transmit and receive. On transmit the user can scroll through up to 500 aliases on the display. Once user selects the name the user can then call that unit. On receive if a unit ID corresponds with an alias, then that alias is shown on the display.	Allows users to quickly identify transmissions. You don't need to cross reference names to a table or memorize a bunch of numbers. Get your message through to the correct person easily. Easily identify other users by name as they communicate.
Call Alert	In an open channel environment it allows users to sound an alert at user's radio when they're not hearing another person's call.	Useful in noisy environments where you may not hear normal calls or when the user is away from their radio.
SelCall	Call individual users on a channel for private communications.	Enhances channel efficiency by allowing users to call a selected radio out in the field without disturbing other users.
Emergency Call	Push the emergency button or use the "man down" option board (UT-124 for handheld units) to send an emergency signal to the dispatch, as well as to other units (silent or audible). After the dispatch acknowledges the emergency signal, the radio automatically ceases sending out the signal, clearing the channel for normal traffic.	Allows users to quickly identify who transmitted an emergency signal. The PTT ID of the unit that transmitted the emergency call is displayed on screen. Essential for the public safety and plant security, as well as in any hazardous, high-risk area. The silent mode allows the user to call for help without alerting the people around them.
Auto Emergency Retransmit	If an initial emergency attempt(s) is unsuccessful due to the radio channel traffic, the radio will automatically send multiple emergency signals until it gets through. The number of retry attempts required to activate this function is programmable.	Maximizes the chance that an emergency call can be heard in a high-traffic environment.
Call log*1	Displays the received call history of the SelCall, Call alert and Emergency call.	Log information includes the type of call, who placed the call, and when the call was placed.
Emergency "Hot Mic" Monitoring	After the dispatch acknowledges an emergency message, the radio can transmit anything the microphone hears for a preprogrammed time period.	The dispatcher can listen into the environment where the emergency is taking place to help identify if an emergency exists, or what is occurring near the user.
Emergency Man Down*2	Allows the radio to automatically initiate any of the emergency features, when a "man down" condition exists (UT-124 man down unit is required).	If someone is in trouble, the radio will automatically activate the emergency function.

*1 IC-F1721, IC-F1821, IC-F5061 and IC-F70 series only. See the back page. *2 IC-F70 and IC-F33G series only. *3 IC-F1721, IC-F1821 and IC-F5061 series only. *4 I6 status messages per MDC system, 5 MDC systems available.

MDC 1200 Signalling Features

Feature	Function	Benefit
Status	Allows a user to set up to 80*4 conditions such as “on duty”, “at lunch”, or “in route”. After a unit sends its status to the dispatch/controller, its status will be maintained in memory until changed. Also program radios*1 to poll other unit for their current status.	Immediately informs the dispatch of your current status and allows the dispatcher/controller to obtain status at any time.
Message	Send and receive*1 up to 80*4 programmable messages to the dispatch.	Improves channel efficiency allowing user to send commonly used messages using MDC instead of voice. Enables privacy by sending messages in digital format rather than voice and only the dispatcher can receive the messages.
Stun	Send*1 and receive stun commands. This feature will place a subscriber unit in a stunned state where no functionality is available until a revive command is received.	Program the radio to either disable other units or be remotely disabled itself in the event of an unauthorized use or a theft. Excellent for maintaining communication integrity with minimal disruption.
Revive	Send*1 and receive revive commands. This feature will revive a subscriber unit that previously received a stun command. Until a stunned unit receives this command, all functions will be locked out.	In the event that a radio was stunned, the dispatch can remotely revive the radio.
Radio Check	Allows the dispatch to verify if a radio is powered on and within the communications range.	Check to see if a remote radio in the field is on, without disturbing or notifying the user. Also check for missing radio before initiating stun.
External Output*3	Available on mobile units. Program this output to become active when receives an emergency, select or call alert call. Connect this output to an external device such as a siren or alarm strobe light.	Allows the user to customize their mobile systems for special modifications when radio receives a select call, call alert or emergency call.
Multiple MDC Profiles	Configure up to 5 different combinations of all MDC functions. Store specific profiles for the applications needed on each channel.	Allows different MDC ID numbers to be used in the same radio, depending upon channel selected. Perfect for integrating one radio into multiple agency communications systems or multiple locations.
Compatible with Other MDC 1200 System	Behaviorally compatible with Motorola’s MDC 1200 functionality and operations.	Easily integrate Icom radios into your existing fleet using MDC 1200.

*1 IC-F1721, IC-F1821, IC-F5061 and IC-F70 series only. See the back page. *2 IC-F70 and IC-F33G series only. *3 IC-F1721, IC-F1821 and IC-F5061 series only. *4 16 status messages per MDC system, 5 MDC systems available.

2-5 Key Features of BIIS 1200 Signalling

BIIS 1200 Compatible

Transport, logistics, utilities, public safety... Those professional mobile users require efficient but cost effective systems for managing their organization. The BIIS 1200 standard is the best choice to add a data service to an existing system. The BIIS system provides AVL, text and status message services as well as voice communication.

What is BIIS 1200?

BIIS 1200 (Binary Interchange of Information and Signalling) is a signalling protocol standardized by ETSI (European Telecommunications Standards Institute). The protocol allows users to send and receive short status messages as well as messaging updates.

The 1200 in the BIIS 1200 name signifies that data is transmitted at the high speed rate of 1200 bits per second (Baud) MSK modulation.

Key Features

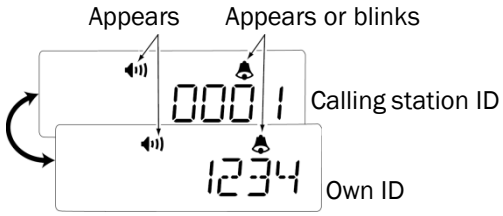
Compatible with conventional radios

The BIIS radios are fully compatible with the conventional version of other Icom models. Conventional channels and BIIS channels are programmable in the same radio and can be selected on site.

Receiving a call

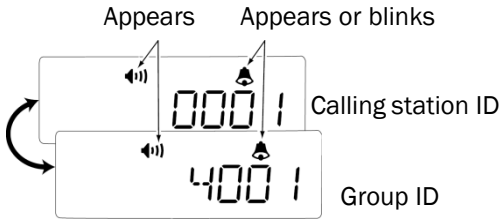
When an **individual call** is received;

- " " appears and the mute is released.
- " " appears or blinks depending on the setting.
- The own ID (or text) and the calling station ID (or text) is displayed alternately, depending on the setting.



When a **group call** is received;

- " " appears and the mute is released.
- " " appears or blinks depending on the setting.
- The group ID (or text) and the calling station ID (or text) is displayed alternately, depending on the setting.



Displaying the received **call record**

The transceiver memorizes the calling station ID in the memory. Up to 3 calls can be memorized, and the oldest call record is erased when a 4th call is received. However, once the transceiver is powered OFF, the all records are cleared.

Transmitting a call

A total of 3 ways for code selection are available—selecting the call code from memory, entering the call code from the keypad and calling back from the queue channel record.

Receiving a message

When a **status message** is received;

- The calling station ID (or text) and the status message is displayed alternately, depending on the setting.

When an **SDM** is received;

- The calling station ID (or text) and the SDM is displayed alternately, depending on the setting.

Received **message selection**

The transceiver memorizes the received messages in the memory. Up to 6 messages for status and SDM, or 95 character SDM's can be memorized. The oldest message is erased when the 7th message is received. However, once the transceiver is powered OFF, all messages are cleared.

Transmitting a status

The status message can be selected with the programmed text, and the message text is also displayed on the function display of the called station. Up to 24 status types (1 to 24) are available, and the status messages 22 and 24 have designated meanings.

Status 22: Emergency*
Status 24: GPS request
*The status 22 can also be used as a normal status message by disabling the designated meaning. However, the status 24 is fixed.

The status call can be sent with both individual and group calls.

Transmitting an SDM

The short data message, SDM, can be sent to an individual station or group stations. Also, 8 SDM memory channels are available and the messages can be edited via PC programming.

Key Features of BIIS 1200 Signalling

BIIS 1200 Compatible

Position data transmission
When the optional OPC-966 INTERFACE CABLE and a GPS receiver is connected to the transceiver, the position (longitude and latitude) data can be transmitted automatically.

Printer connection
When the optional OPC-966 INTERFACE CABLE is connected to the transceiver, a printer can be connected to print out the received SDM content and the ID of the station who sent the message.

PC connection
When the optional OPC-966 INTERFACE CABLE is connected to the transceiver, a PC can be connected to provide remote control, data reception, etc.

Digital ANI
The own ID can be transmitted each time the PTT is pushed (log-in) or released (log-off) during individual or group call communications. By receiving the ANI, the communication log can be recorded when using a PC dispatch application.

In addition, when using the ANI with log-in, the PTT side tone function can be used to inform you that the ID is sent and voice communication can be performed.

Emergency transmission
When [Emergency] is pushed, an emergency signal is automatically transmitted for the specified time period.

The status 22 (Emergency) is sent to the selected ID station, and the position data is transmitted after the emergency signal when a GPS receiver is connected to the transceiver.

The emergency transmission is performed on the emergency channel, however, when no emergency channel is specified, the signal is transmitted on the previously selected channel.

Stun function
When the specified ID, set as a killer ID, is received, the stun function is activated.

When the killer ID is received, the transceiver switches to the passcode required condition. Entering of the passcode via the keypad is necessary to operate the transceiver again in this case.

BIIS indication
The following indications are available for the BIIS operation on an MSK channel.

CONNECT	: Individual/group call is successful.
OK	: Message (status or SDM) transmission is successful.
FAILED	: No answer back is received.
WAIT	: Appears during retry of the call (2nd call).
CLR DOWN	: End the communication.
BUSY	: Operating channel is in the busy condition.

Priority A channel selection
When one of the following operations is performed, the transceiver selects the Priority A channel automatically.

Priority A is selected when;

- Clear down signal is received/transmitted
  - Set the “Move to PrioA CH” item as “Clear Down.”
- Turning the power ON
  The Priority A channel is selected each time the transceiver power is turned ON.
- Status call
  The Priority A channel is selected when transmitting a status call.
  - Enable the “Send Status on PrioA CH” item in the MSK configuration.

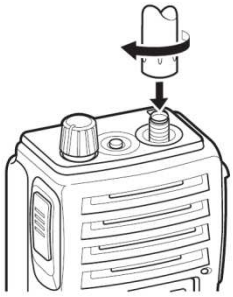
2-6 Function and Specifications Comparison
2-6-1 VHF Handheld Transceivers

Model No.			IC-F50V	IC-F50V	IC-F50V	IC-F50V	IC-F50V	IC-F50V
Version			#01	#06	#11	#03	#08	#13
Destinations			USA	USA-01	USA-02	EXP	EXP-01	EXP-02
Keypad Type			Simple Type			Simple Type		
Type Approval			FCC	FCC	FCC			
Supplied Antenna			FA-S59V	FA-S59V	FA-S59V	FA-S59V	FA-S59V	FA-S59V
Function Comparison								
CTCSS			✔	✔	✔	✔	✔	✔
DTCS			✔	✔	✔	✔	✔	✔
2-Tone			✔	✔	✔	✔	✔	✔
5-Tone			✔	✔	✔	✔	✔	✔
DTMF Autodial			✔	✔	✔	✔	✔	✔
DTMF Decoder								
BIIS 1200			✔	✔	✔	✔	✔	✔
MDC 1200			✔	✔	✔	✔	✔	✔
MPT 1327								
LTR™ Trunking								
PassPort								
BTL audio amp			✔	✔	✔	✔	✔	✔
Vibration alert				✔	✔		✔	✔
Voice recorder					✔			✔
Intrinsically Safe								
SPECIFICATIONS								
GENERAL	Frequency Range (MHz)		136 ~ 174			136 ~ 174		
	Number of channels		Max. 128 ch/8 zones			Max. 128 ch/8 zones		
	Channel Spacing (kHz)		15/30kHz			12.5/25kHz		
	PLL channel step (Unit: kHz)		2.5, 3.125			2.5, 3.125		
	Current drain	Tx 5W	1.8A			1.8A		
		Tx 1W	0.7A			0.7A		
		Rx Stand-by	85mA			85mA		
		Rx Max. audio	500mA (Internal speaker) 350mA (External speaker)			500mA (Internal speaker) 350mA (External speaker)		
	Operating Time (with BP-227)		10 hours*1			10 hours*1		
	Dimensions (W × H × D) (projections not included)		56 × 97 × 36.4 mm $2^{7}/_{32} \times 3^{13}/_{16} \times 1^{7}/_{16}$ in.			56 × 97 × 36.4 mm $2^{7}/_{32} \times 3^{13}/_{16} \times 1^{7}/_{16}$ in.		
	Weight (approx.)		280g; 9.9oz (with BP-227)			280g; 9.9oz (with BP-227)		
TX	RF output power (High)		5W			5W		
	Spurious emissions		70dB (typ.)			70dB (typ.)		
	Adjacent channel power (W/N)		70/60dB (min.)			70/60dB (min.)		
RX	Sensitivity at 12dB SINAD		0.25μV (typ.)			0.25μV (typ.)		
	Adjacent channel selectivity (W/N)		75/65dB (typ.)			75/65dB (typ.)		
	Spurious response rejection		70dB			70dB		
	Intermodulation rejection		74dB (typ.)			74dB (typ.)		
	Audio output power (at 5% distortion with an 8Ω load)		0.7W typ. (Internal speaker) 0.5W typ. (External speaker)			0.7W typ. (Internal speaker) 0.5W typ. (External speaker)		

*1 Operating time is approximate time (at 20°C). Tx: Rx: standby=5:5:90. Power save on.

2-7 Supplied Accessory Attachments

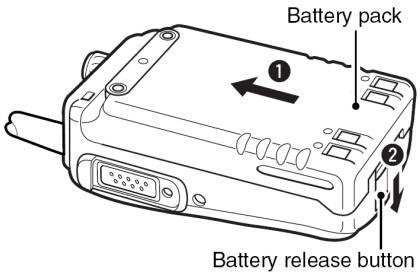
Attach the supplied accessories as shown below.



➢ Flexible antenna

Connect the supplied flexible antenna to the antenna connector.

CAUTION!
- **NEVER HOLD** by the antenna when carrying the transceiver.
- Transmitting without an antenna may damage the transceiver.



➢ Battery pack

To attach the battery pack:

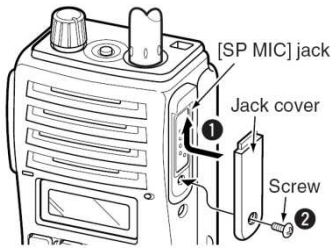
Slide the battery pack in the direction of the arrow (①), then lock it with the battery release button.
- Slide the battery pack until the battery release button makes a 'click' sound.

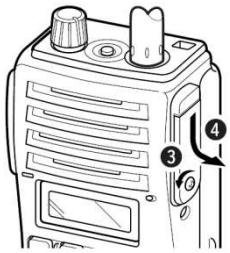
To release the battery pack:

Push the battery release button in the direction of the arrow (②) as shown below. The battery pack is then released.

NEVER release or attach the battery pack when the transceiver is wet or soiled. This may result water or dust getting into the transceiver/battery pack and may result in the transceiver being damaged.

NOTE: Keep the battery pack terminals clean. It's a good idea to clean the battery pack terminals once a week.





➢ Jack cover

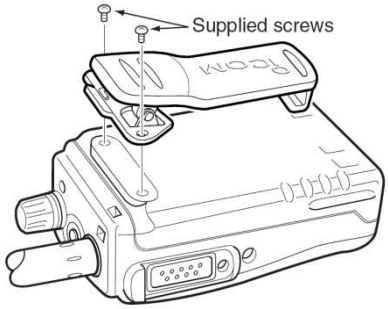
Attach the jack cover when the optional speaker-microphone is not used.

To attach the jack cover:

1. insert the jack cover into the [SP MIC] jack.
2. Tighten the screws.

To detach the jack cover:

3. Unscrew the screw using a Phillips screwdriver.
4. Detach the jack cover for the optional equipment connection.



➢ Belt clip

Attach the belt clip to the back of the transceiver with the supplied screws.

2-8 Optional Accessories

Current options available are shown below. Ask your Icom distributor for further details if required.

BATTERY PACKS and CASE

▲ **BP-227**

Li-Ion BATTERY PACK, 7.2V/1700mAh
Provides 10 hours operating time (approx.).

▲ **BP-226**

BATTERY CASE:
AA (LR6) × 5 alkaline cells.
BP-226 is water-resistant, equivalent to IPX4.

REGULAR CHARGER

▲ **BC-147** ▲ **BC-152**

BC-152 DESKTOP CHARGER + **BC-147A/E** AC ADAPTER
Regularly charges the BP-227 in 9-10 hours (approx.).

RAPID CHARGER

▲**AD-100**

▲ **BC-145** ▲ **BC-119N**

BC-119N DESKTOP CHARGER + **AD-100** CHARGER ADAPTER + **BC-145A/E/V** AC ADAPTER
Rapidly charges the BP-227N in 2-2.5 hours (approx.).

MULTI-CHARGER

▲ **BC-121N** ▲**AD-100 (6 pcs).** ▲ **BC-157**

BC-121N MULTI-CHARGER + **AD-100** CHARGER ADAPTER
+ **BC-157** AC ADAPTER
Rapidly charges up to 6 battery packs (Six AD-100s are required) in 2-2.5 hours.

POWER SUPPLY CABLES

▲ **CP-17L**

CP-17L CIGARETTE LIGHTER CABLE,

▲ **OPC-515L**

OPC-515L DC POWER CABLE for use with the BC-119N. (12–16V DC required).

▲ **OPC-656**

OPC-656 DC POWER CABLE for use with the BC-121N. (12–20V DC required).

BELT CLIPS

MB-86: Swivel type

MB-98 : Alligator type
Same as supplied.

LEATHER BELT HANGERS

MB-96N : Swivel type.
MB-93 swivel joints supplied

MB-96F : Fixed type

Optional Accessories

HEADSETS and PTT/VOX UNIT

HS-94 : Earhook headset with flexible boom microphone.

HS-95 : Behind-the-head headset with flexible boom microphone.

HS-97 : Throat microphone fits around the neck and picks up speech vibration.

VS-1SC : PTT/VOX unit. Required when using these headsets with the transceiver

SPEAKER-MICROPHONES

HM-138 : Full size speaker-microphone. Equivalent to IPX7.

HM-168 : Compact type speaker-microphone. Equivalent to IPX7.

HM-169 : Rugged type speaker-microphone. Equivalent to IP57.

HM-170GP : GPS speaker-microphone for BIIS mode. Equivalent to IP57.

ANTENNAS

FA-S24V
136–150MHz, Blue
FA-S59V
150–174MHz, Red

STUBBY ANTENNAS

FA-S62V
150–162MHz, Red
FA-S63V
160–174MHz, Green

CLONING CABLE

OPC-966U
CLONING CABLE (USB type)
OPC-966U
+ OPC-1637
+ USB driver

OPC-966
CLONING CABLE (RS-232C type)

CLONING SOFTWARE

CS-F50V
For programming all versions of the IC-F50V series VHF HANDHELD TRANSCEIVERS.

2-8-1 Battery/Battery Charging - Caution

■ Caution

Misuse of Lithium-Ion batteries may result in the following hazards: smoke, fire, or the battery may rupture. Misuse can also cause damage to the battery or degradation of battery performance.

⚠ **DANGER!** Use and charge only specified Icom battery packs with Icom radios or Icom charger. Only Icom battery packs are tested and approved for use and charge with Icom radios or Icom charger. Using third-party or counterfeit battery packs or charger may cause smoke, fire, or cause the battery to burst.

◇ Battery caution

⚠ **DANGER! DO NOT** hammer or otherwise impact the battery. Do not use the battery if it has been severely impacted or dropped, or if the battery has been subjected to heavy pressure. Battery damage may not be visible on the outside of the case. Even if the surface of the battery does not show cracks or any other damage, the cells inside the battery may rupture or catch fire.

⚠ **DANGER! NEVER** use or leave battery packs in areas with temperatures above +60°C (+140°F). High temperature buildup in the battery, such as could occur near fires or stoves, inside a sun heated car, or in direct sunlight may cause the battery to rupture or catch fire. Excessive temperatures may also degrade battery performance or shorten battery life.

⚠ **DANGER! DO NOT** expose the battery to rain, snow, seawater, or any other liquids. Do not charge or use a wet battery. If the battery gets wet, be sure to wipe it dry before using. The battery is not waterproof.

⚠ **DANGER! NEVER** incinerate used battery packs since internal battery gas may cause them to rupture, or may cause an explosion.

⚠ **DANGER! NEVER** solder the battery terminals or NEVER modify the battery pack. This may cause heat generation, and the battery may rupture, emit smoke or catch fire.

⚠ **DANGER!** Use the battery only with the transceiver for which it is specified. Never use a battery with any other equipment, or for any purpose that is not specified in this instruction manual.

⚠ **DANGER!** If fluid from inside the battery gets in your eyes, blindness can result. Rinse your eyes with clean water, without rubbing them, and see a doctor immediately.

WARNING! Immediately stop using the battery if it emits an abnormal odor, heats up, or is discolored or deformed. If any of these conditions occur, contact your Icom dealer or distributor.

WARNING! Immediately wash, using clean water, any part of the body that comes into contact with fluid from inside the battery.

WARNING! NEVER put the battery in a microwave oven, high pressure container, or in an induction heating cooker. This could cause a fire, overheating, or cause the battery to rupture.

CAUTION! Always use the battery within the specified temperature range for the transceiver (–30°C to +60°C; –22°F to +140°F) and the battery itself (–10°C to +60°C; 14°F to +140°F). Using the battery out of its specified temperature range will reduce the battery's performance and battery life. Please note that the specified temperature range of the battery may exceed that of the transceiver. In such cases, the transceiver may not work properly because it is out of its operating temperature range.

CAUTION! Shorter battery life could occur if the battery is left fully charged, completely discharged, or in an excessive temperature environment (above +45°C; +113°F) for an extended period of time. If the battery must be left unused for a long time, it must be detached ◇from the radio after discharging. You may use the battery until the remaining capacity is about half, then keep it safely in a cool dry place with the temperature between –20°C to +35°C (–4°F to +95°F).

◇Charging caution

⚠ **DANGER! NEVER** charge the battery pack in areas with extremely high temperatures, such as near fires or stoves, inside a sun heated car, or in direct sunlight. In such environments, the safety/protection circuit in the battery will activate, causing the battery to stop charging.

WARNING! DO NOT charge or leave the battery in the battery charger beyond the specified time for charging. If the battery is not completely charged by the specified time, stop charging and remove the battery from the battery charger. Continuing to charge the battery beyond the specified time limit may cause a fire, overheating, or the battery may rupture.

WARNING! NEVER insert the transceiver (battery attached to the transceiver) into the charger if it is wet or soiled. This could corrode the battery charger terminals or damage the charger. The charger is not waterproof.

CAUTION! DO NOT charge the battery outside of the specified temperature range: 0°C to +45°C; +32°F to +113°F. Icom recommends charging the battery at +20°C (+68°F). The battery may heat up or rupture if charged out of the specified temperature range. Additionally, battery performance or battery life may be reduced.

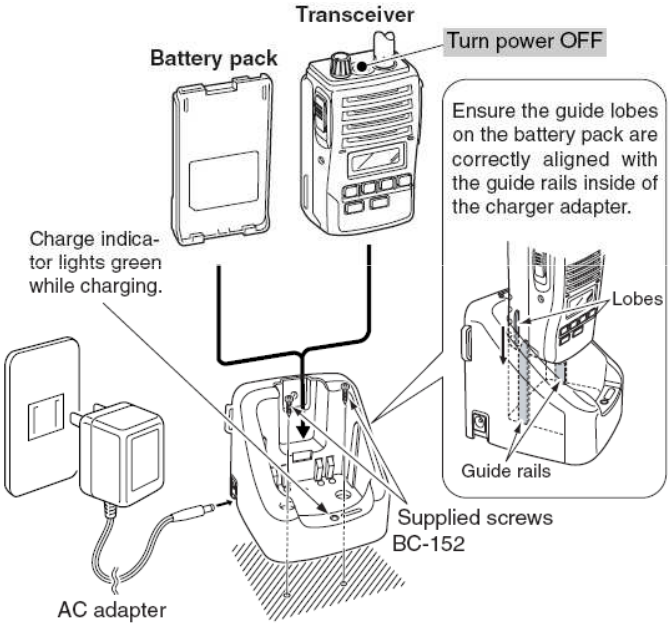
Battery Charging and Battery Case

The charging instructions below are shown here for your reference.

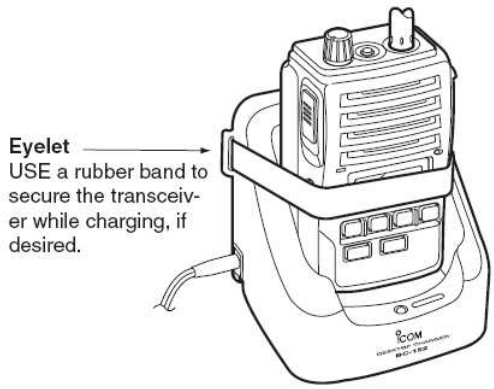
■ Using the optional battery chargers

➢ Regular charging with the BC-152

① Attach the BC-152 to a flat surface, such as a desk, if desired.
② Connect the AC adapter (BC-147) as shown below.
③ Insert the battery pack with/without the transceiver into the charger.
  • The charge indicator lights green.
④ Charge the battery pack approx. 9–10 hours, depending on the remaining power condition.
  • The charge indicator goes off when charging is completed.


Transceiver
Battery pack
Turn power OFF
Ensure the guide lobes on the battery pack are correctly aligned with the guide rails inside of the charger adapter.
Charge indicator lights green while charging.
Lobes
Guide rails
Supplied screws BC-152
AC adapter

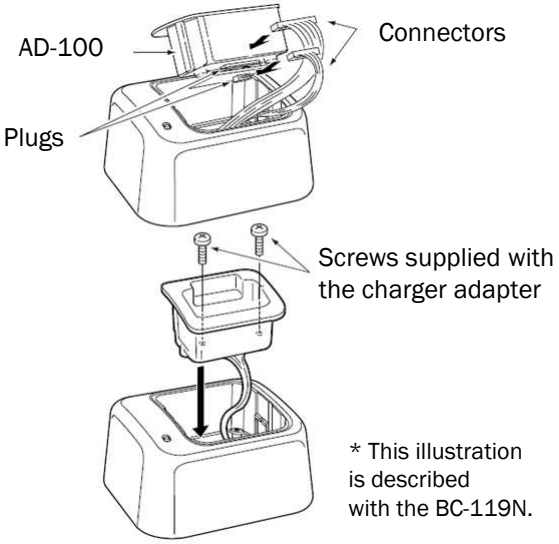
➢ For your convenience



➢ AD-100 installation

The AD-100 CHARGER ADAPTER must be installed into the BC-119N or BC-121N before battery charging.

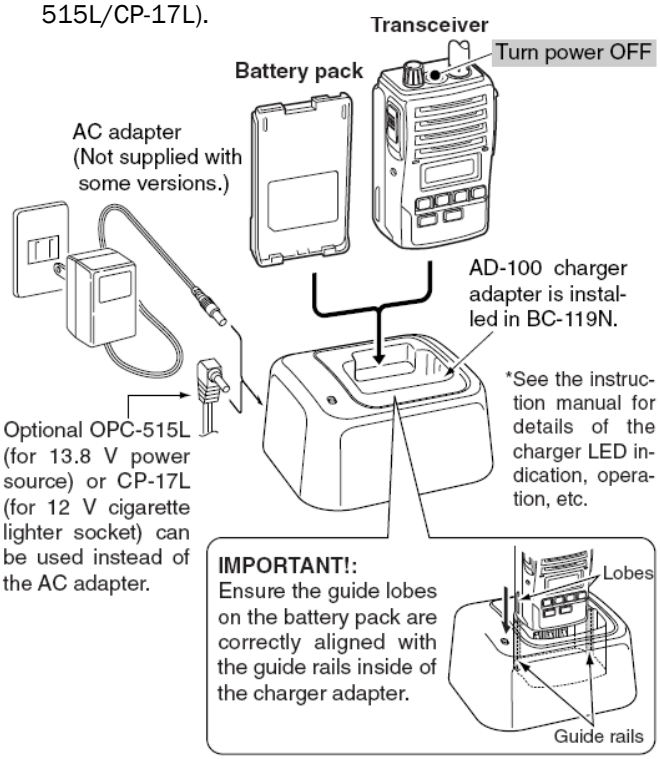
➥ Connect the AD-100 CHARGER ADAPTER and the BC-119N/BC-121N as below, then install the AD-100 into the holder space of the BC-119N or BC-121N with the supplied screws.



➢ Rapid charging with the BC-119N+AD-100

The optional BC-119N provides rapid charging of the optional Li-Ion battery pack. The following items are additionally required:

• An AD-100 charger adapter
• An AC adapter (may be supplied with BC-119N depending on version) or the DC power cable (OPC-515L/CP-17L).

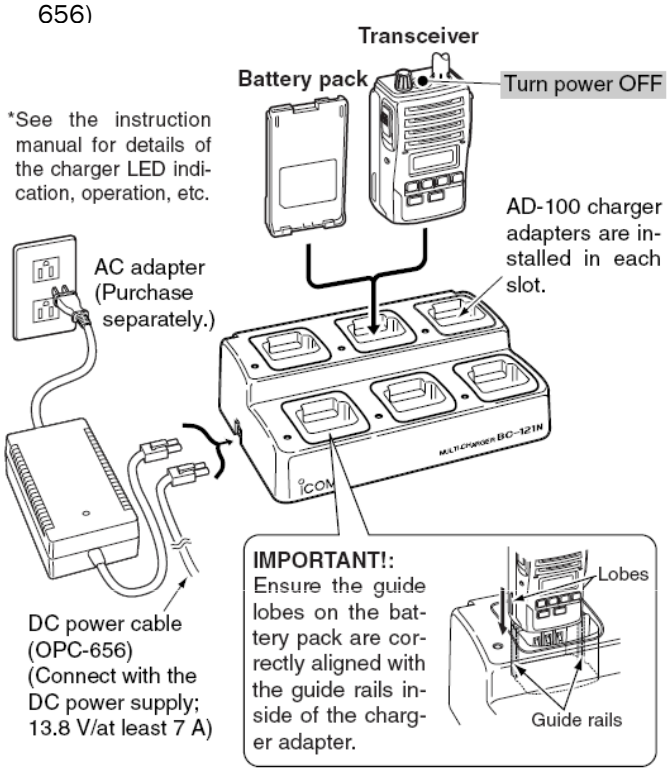

Transceiver
Battery pack
Turn power OFF
AC adapter (Not supplied with some versions.)
AD-100 charger adapter is installed in BC-119N.
*See the instruction manual for details of the charger LED indication, operation, etc.
Optional OPC-515L (for 13.8 V power source) or CP-17L (for 12 V cigarette lighter socket) can be used instead of the AC adapter.
IMPORTANT!:
Ensure the guide lobes on the battery pack are correctly aligned with the guide rails inside of the charger adapter.
Lobes
Guide rails

Battery Charging and Battery Case

➢ Rapid charging with the BC-121N+AD-100

The optional BC-121N allows up to 6 battery packs to be charged simultaneously. The following items are additionally required.

- Six AD-100 charger adapters
- An AC adapter (BC-157) or the DC power cable (OPC-656)


Transceiver
Battery pack
Turn power OFF
*See the instruction manual for details of the charger LED indication, operation, etc.
AD-100 charger adapters are installed in each slot.
AC adapter (Purchase separately.)
DC power cable (OPC-656) (Connect with the DC power supply; 13.8 V/at least 7 A)
IMPORTANT!: Ensure the guide lobes on the battery pack are correctly aligned with the guide rails inside of the charger adapter.
Lobes
Guide rails

■ Optional battery case (BP-226)

When using the optional battery case attached to the transceiver, install 5 × AA (LR6) size alkaline batteries as illustrated at right. The BP-226 is constructed to the IPX4 waterproof standard (IEC 60529, 2006).

① Hook your finger under the latch, and open the cover in the direction of the arrow (❶). (Fig.1)

② Install 5 × AA (LR6) size alkaline batteries. (Fig.2)

- Install the alkaline batteries only.
- Be sure to observe the correct polarity.
- Do not pin the ribbon under the batteries.

③ Close the cover by fitting in the direction of the arrow (❷) first, then check that the latch is in place (❸). (Fig.1)

- Be sure the gasket and the ribbon are seated correctly, and do not protrude from the battery case. (Fig.3)

CAUTION:

- When installing batteries, make sure they are all the same brand, type and capacity. Also, do not mix new and old batteries together.
- Keep battery contacts clean. It's a good idea to clean battery terminals once a week.
- Never incinerate used battery cells since internal battery gas may cause them to rupture.
- Never expose a detached battery case to water. If the battery case gets wet, be sure to wipe it dry before using it.

Fig.1

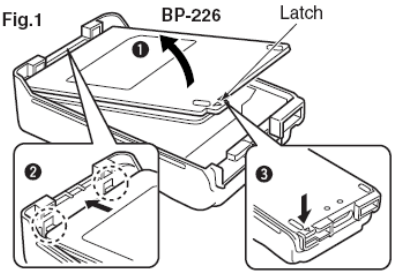


Fig.2

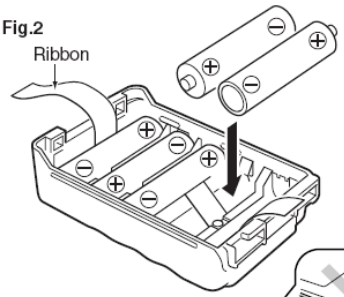
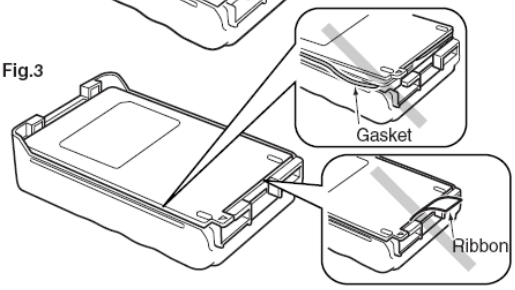


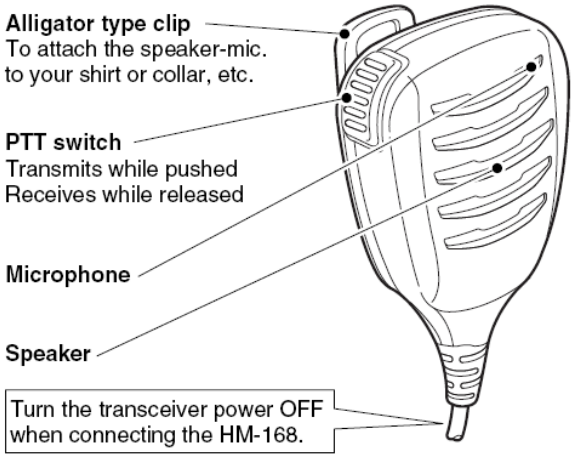
Fig.3



2-8-2 Optional Speaker-Microphone

SPEAKER-MICROPHONE

■ Optional HM-168 description

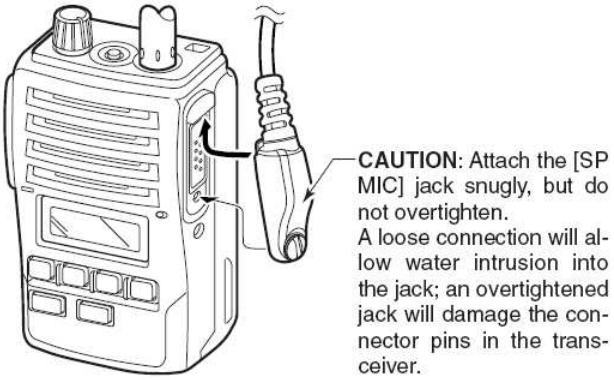

Alligator type clip
To attach the speaker-mic. to your shirt or collar, etc.
PTT switch
Transmits while pushed
Receives while released
Microphone
Speaker
Turn the transceiver power OFF when connecting the HM-168.

NEVER immerse the connector in water. If the connector becomes wet, be sure to dry it BEFORE attaching it to the transceiver.

NOTE: The microphone is located at the top of the speaker-microphone, as shown in the diagram above. To maximize the readability of your transmitted signal (voice), hold the microphone approx. 5 to 10 cm (2 to 4 inches) from your mouth, and speak in a normal voice level.

■ Attachment

Attach the connector of the speaker-microphone into the [SP MIC] jack on the transceiver and tighten the screw.


CAUTION: Attach the [SP MIC] jack snugly, but do not overtighten.
A loose connection will allow water intrusion into the jack; an overtightened jack will damage the connector pins in the transceiver.

IMPORTANT: KEEP the [SP MIC] jack cover attached to the transceiver when the speaker-microphone is not in use. (p. 15) Water will not get into the transceiver even if the cover is not attached, however, the terminals (pins) will become rusty, or the transceiver will function abnormally if the connector becomes wet.

■ Optional HM169 & HM170GP description

The HM-169 and HM-170GP are rugged and waterproof speaker microphones, equivalent to IP57 which can withstand submersion in 1m depth of water for up to 30 minutes

The HM-170GP is Icom's first GPS microphone which is designed to be used for position reporting applications via BIIS1200 signaling . The GPS-embedded and non-GPS microphones are designed to stand years of rough use by professionals and extreme outdoor activities in the field.

The GPS module used in the GPS microphones has one of the highest sensitivity levels available today. It will provides accurate position data when the less sensitive competition suffers erratic results from deteriorated GPS signal strength. The 1.0m CEP50* (1.2m CEP95) accuracy performance is better than any known similar products sold in the market.

* 1.0m CEP 50 = 1.0m Circular Error Probability 50% = 50% of the measured position data will have less than 1.0m error from the actual position.

Features

HM-169, Plain Version and **HM-170GP,** GPS Version Common Features

- IP57 class environmental protection
- Slim but MIL class ruggedness
- Sturdy rotary type belt clip (metal base)
- Waterproof 9-pin "multi-connector"

HM-170GP, GPS Versions Features

- As sensitive as -156dBm tracking sensitivity (-141dBm for cold acquisition)
- 1.0m accuracy for CEP50 (1.2m for CEP95)
- Less than 4 seconds to "hot" start up (40 sec for cold start)
- Current consumption : 53 ~ 60mA tracking (max. 70mA. at 3.3V)
- NMEA 0183 compatible ($GPRMC etc.)
- The last known good position data is sent while GPS signal is lost (marked "invalid")
- Temperature range : -30C ~ +60C
- Compatible with BIIS1200 GPS-related functions
- One programmable key (this function will work with IC-F50V series only for now)

2-8-3 Optional Swivel Belt Clip

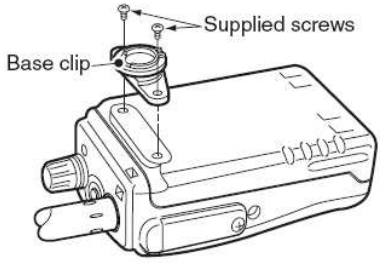
SWIVEL BELT CLIP

■ Optional MB-86 contents

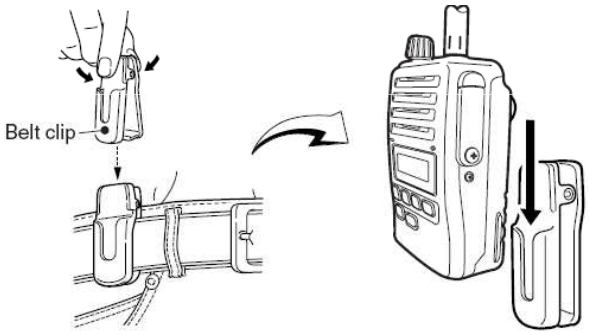
	Qty.
① Belt clip	1
② Base clip	1
③ Screws	2

■ Attaching

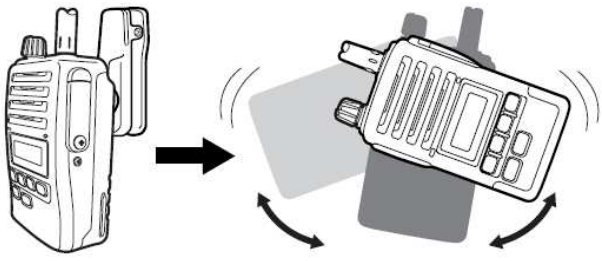
① Attach the base clip to the back of the transceiver.



② Clip the belt clip to a part of your belt and insert the base clip into the belt clip.

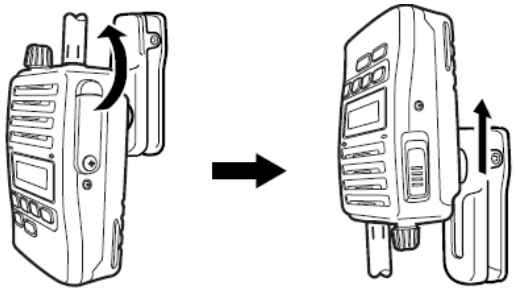


③ Once the transceiver is locked in place, it will swivel 360 degrees.



■ Detaching

Turn the transceiver upside down, and pull out from the belt clip. Then detach the base clip from the back of the transceiver.



CAUTION!

HOLD THE TRANSCEIVER TIGHTLY WHEN ATTACHING OR DETACHING THE TRANSCEIVER FROM THE BELT CLIP.

Otherwise the transceiver may not be attached to the holder, or may not swivel properly if the transceiver is accidentally dropped and the base clip is scratched or damaged.

2-8-4 Optional VS-1SC VOX/PTT Case

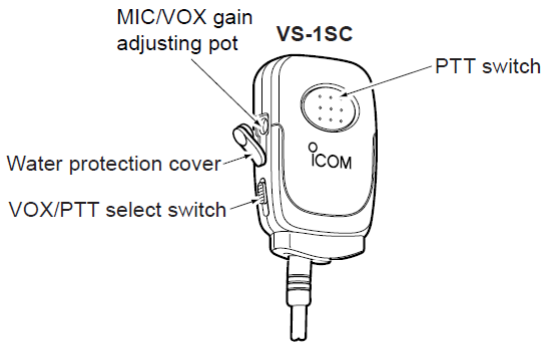
About VS-1SC VOX/PTT Case

The VS-1SC is a VOX/PTT unit for Icom handheld transceivers, and allows you hands-free operation.
An optional headset (HS-94, etc.) is required for operation.

- The VOX (Voice Operated Transmission) function starts transmission without pushing PTT switch when you speak into the microphone; then, automatically returns to receive when you stop speaking.

Features

➥Equipped with a 9-pin Spring-plug type head SP/MIC plug is equipped
➥ Water resistant, durable construction
➥ Equipped with a PTT switch and revolving clip

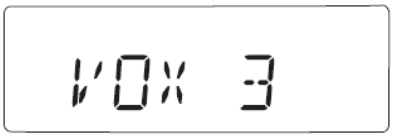


VOX gain and delay adjustment

① Attach the connector of the VS-1SC into the [SP/MIC] connector on the transceiver and tighten the screw.
  • Toggle the toggle switch to [VOX].
② Enter user set mode.
③ Push [P0] several times to select “VOX Gain” or “VOX Delay.”
  Then, push [▼] or [▲] to set the desired level/condition.
④Rotate [VOL] to turn the power OFF to exit set mode.

• VOX Gain

The VOX sensitivity level can be adjusted from OFF, or 1 through 6 for greater sensitivity.



VOX gain level is 3 (default)

• VOX Delay

The VOX delay time can be set from 0.5 to 3.0 sec. (in 0.5 sec. steps) to set the interval before returning to receive.

VOX delay timer is 0.5 sec. (default)

NOTE: MIC/VOX gain can be adjusted by the adjusting pot using a thin screw driver.

Note: Operation of the functions described below may depend on radio programming.

ANTENNA CONNECTOR
Connects the supplied antenna.

RED BUTTON
Desired functions can be programmed by your dealer.

VOLUME CONTROL [VOL]
Rotate to turn the power ON/OFF and adjusts the audio level.

PTT SWITCH [PTT]
➥ Push and hold to transmit; release to receive.
➥ When the recording function is activated, TX voice message can be recorded while pushing and holding [PTT].

EXTERNAL SPEAKER-MICROPHONE JACK [SP MIC]
Connects the optional speaker-microphone, etc.

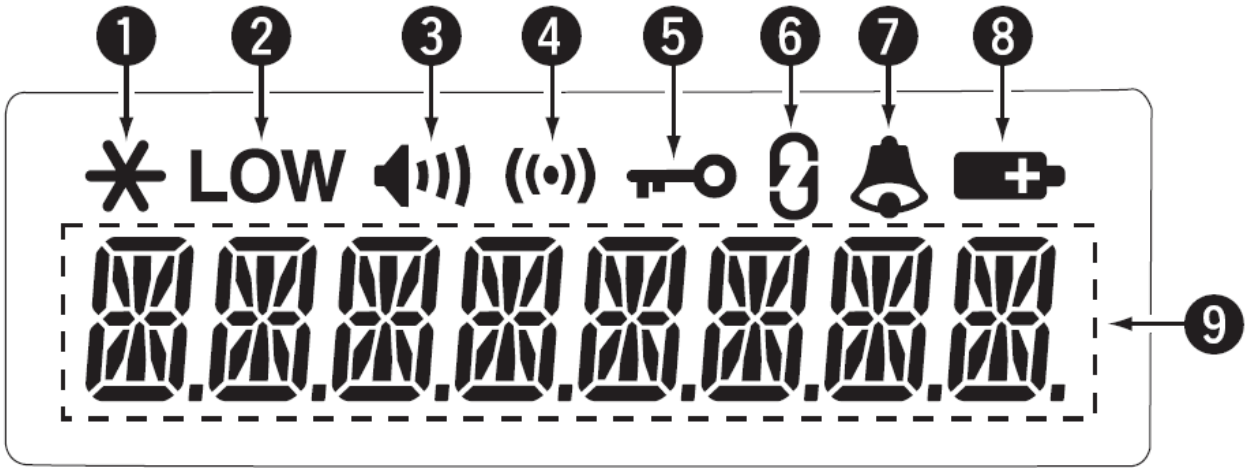
NOTE: KEEP the [SP MIC] jack cover attached to the transceiver when the optional equipment is not used.
(See p. 15 for details)

TRANSMIT/BUSY INDICATOR
Lights red while transmitting; lights green while receiving a signal, or when the squelch is open.

DEALER-PROGRAMMABLE KEYS [P0] to [P3]
Desired functions can be programmed independently by your dealer.

CH UP AND DOWN KEYS [▲]/[▼]
Push to select an operating channel, etc.
*Desired functions can be programmed independently by your dealer.

3-1-1 Function Display



❶ RECORD INDICATOR
- ➥ Appears when an unread message is in the memory.
- ➥ Blinks while recording.

❷ LOW POWER INDICATOR
Appears when low output power is selected.

❸ AUDIBLE INDICATOR
- ➥ Appears when the channel is in the 'audible' (unmute) condition.
- ➥ Appears when the specified 2/5-tone/BIIS*1/MDC*2 code is received.

❹ COMPANDER INDICATOR
Appears when the compander function is activated.

❺ KEY LOCK INDICATOR
Appears when the key lock function is activated.

❻ SCRAMBLER INDICATOR
Appears when the voice scrambler function is activated.

❼ BELL INDICATOR
Appears/blinks when the specific 2/5-tone/BIIS*1/MDC*2 code is received, according to the pre-programming.

❽ BATTERY INDICATOR
Appears or blinks when the battery power decreases to a specified level.

❾ ALPHANUMERIC DISPLAY
Displays an operating channel number, channel names, Set mode contents, DTMF code, etc.

*1 BIIS operation only
*2 MDC operation only

3-1-2 Functions Programmable to Keys

Note 1: Assigned functional key selection depends on programming software setup.
Note 2: The functions exclusive to MDC mode are indicated in Blue and BIIS mode are indicated in Green.

The following functions can be assigned to **[P0], [P1], [P2], [P3], [Red], [▼]** and **[▲]** programmable function keys.
Consult your Icom dealer or system operator for details concerning your transceivers programming.
If the programmable function names are bracketed in the following explanations, the specific key is used to activate the function depends on programming.

CH UP AND DOWN KEYS

➥ Push to select an operating channel.
➥Push to select a transmit code channel after pushing [TX Code CH Select].
➥Push to select a DTMF channel after pushing [DTMF Autodial].
➥Push to select a scan group after pushing and holding [Scan A Start/Stop]/[Scan B Start/Stop].

ZONE SELECT KEY

Push this key, then select the desired zone using [CH Up]/[CH Down].

What is "zone"?— The desired channels are assigned into a zone according to the intended use for grouping. For example, 'Staff A' and 'Staff B' are assigned into a "Business" zone, and 'John' and 'Cindy' are assigned into a "Private" zone.

SCAN A START/STOP KEY

➥This key's operation depends on the Power ON Scan setting.
When the power ON scan function is turned OFF;
Push to start and cancel scanning operation.
When the power ON scan function is turned ON;
Push to pause scanning, then resumes scanning after a specified time period has passed.
➥Push and hold this key for 1 sec. to indicate the scan group, then select the desired scan group using [CH Up]/[CH Down].

SCAN B START/STOP KEY

➥Push to start and cancel scanning operation. Scan resumes after a specified time period has passed when scan is cancelled except for this key.
➥Push and hold this key for 1 sec. to indicate the scan group, then select the desired scan group using [CH Up]/[CH Down].

SCAN ADD/DEL (TAG) KEY

➥Push to add or delete the selected channel to/from the scan group.
1. Push to indicate the scan group, then push [CH Up] or [CH Down] to select the desired group.
2. Push to add or delete the channel to/from the selected scan group.
3. Push and hold for 1 sec. to exit the scan group selection mode.

➥Push this key while scan is paused (a signal is detected) on a channel (except for priority channel,) the channel is cleared from the scan group.

Depending on the setting, the cleared channel is added to the scan group again after the scan is cancelled. (Nuisance Delete function)

PRIORITY CHANNEL KEYS

➥Push to select Priority A or Priority B channel.
➥Push and hold [Prio A (Rewrite)] or [Prio B (Rewrite)] to set the operating channel as the Priority A or Priority B channel.

MR-CH 1/2/3/4 KEYS

Push to select the memory channel 1 to 4 directly.

LOCK KEY

Push and hold to toggle the key lock function ON or OFF.
• All programmable keys except the followings are electronically locked when the key lock function is activated: [PTT], [Light], [Lone Worker], [Surveillance], [Call] (incl. Call A and Call B), [Moni(Audi)] and [Emergency].

MONITOR KEY

➥Mute and release the CTCSS (DTCS) or 2-tone squelch mute. Open any squelch/deactivate any mute while pushing and holding this key. (LMR operation only)
➥Activates one of (or two of) the following functions on each channel independently: (PMR operation only)
• Push and hold to un-mute the channel (audio is emitted; 'Audible' condition).
• Push to mute the channel (sets to 'Inaudible' only).
• Push after the communication is finished to send a 'reset code'. (BIIS operation only)

NOTE: The un-mute condition ('Audible' condition) may automatically return to the mute condition ('Inaudible' condition) after a specified period.

Functions Programmable to Keys

LIGHT KEY
Push to turn the backlight ON for about 5 sec. even if the backlight function is turned OFF in user set mode.

LONE WORKER KEY
Push to turn the Lone Worker function ON or OFF.
- If the Lone Worker function is activated, the Emergency function is automatically turned ON after the specified time period has passed with no operation is performed.

HIGH/LOW KEY
Push to select the transmit output power temporarily or permanently, depending on the pre-setting.
- Ask your dealer for the output power level for each selection.

C.TONE CHANNEL ENTER KEY
Push to enter the continuous tone channel selection mode, and push [CH Up]/[CH Down] to change the tone frequency/code setting. The selected channel remains set as the continuous tone channel until another channel is designated as such.

TALK AROUND KEY
Push to turn the talk around function ON and OFF.
- The talk around function equalizes the transmit frequency to the receive frequency for transceiver-to-transceiver communication.

WIDE/NARROW KEY
Push to toggle the IF bandwidth between wide and narrow.
- The wide passband width can be selected from 25.0 or 20.0 kHz using the CS-F50V CLONING SOFTWARE. (PMR operation in Germany only) Ask your dealer for details.

DTMF AUTODIAL KEY
➥Push to enter the DTMF channel selection mode. Then select the desired DTMF channel using [CH Up]/[CH Down].
➥After selecting the DTMF channel, push again to transmit the selected DTMF code.

DTMF RE-DIAL KEY
Push to transmit the last-transmitted DTMF code.
- TX memories are cleared after turning the transceiver OFF.

CALL KEYS
Push to transmit a 2/5-tone/BIIS ID code.
- Call transmission is necessary before calling another station depending on your signalling system.
- [Call A] and/or [Call B] may be available when your system employs selective 'Individual/Group' calls. Ask your dealer which call is assigned to each key.

SURVEILLANCE KEY
Push to turn the surveillance function ON or OFF.
When this function is turned ON, the beep is not emitted and the LCD backlight and the LED indicator do not light when a signal is received or a key is pushed.

EMERGENCY KEYS
Push and hold to transmit the emergency call.
- The emergency call transmits with beeps; the display does not change.
- The transceiver can transmit the emergency call silently or with the display changes depending on the pre-setting. Ask your dealer for details.
- If you want to cancel the emergency call, push and hold the key again before transmitting the call.
- The emergency call is transmitted one time only or repeatedly until receiving a control code, depending on the pre-setting.

TX CODE ENTER KEY (PMR operation only)
Push to enter the TX code edit mode. Then set the desired digit using [CH Up]/[CH Down].

TX CODE CHANNEL SELECT KEY
➥Push to enter the TX code channel selection mode. Then select the desired channel using [CH Up]/[CH Down].
➥While in the TX code channel selection mode, push and hold for 1 sec. to enter the TX code edit mode. Then set the desired digit using [CH Up]/[CH Down]. (PMR operation only)

TX CODE CHANNEL UP/DOWN KEYS
Push to select a TX code channel directly.

ID-MR SELECT KEY (PMR operation only)
➥ Recalls detected ID codes.
  - Push this key, then push [CH Up]/[CH Down] for selection.
  - Up to 5 ID's are memorized.

➥ Push and hold to erase the selected memorized ID's.

VOICE SCRAMBLER FUNCTION
Push to turn the voice scrambler function ON and OFF.

Functions Programmable to Keys

COMPANDER KEY
Push to turn the compander function ON and OFF.
The compander function reduces noise components from the transmitting
audio to provide clearer communication.

USER SET MODE KEY
➥ Push and hold to enter user set mode.
- While in user set mode, push this key to select an item, and push [CH Up]/[CH Down] to change the value or condition.

➥ Push and hold this key again to exit user set mode.
- User set mode is also available via the 'Power ON function'. Please refer to p. 30 also.

PLAYBACK KEY
➥Push to playback the recorded messages in sequence, starting with the latest one.
- A short beep is emitted after playing back each message.
- A long beep is emitted after playing back all messages.
- An error beep is emitted when there are no messages in the memory.

➥While playing back the message, push and hold for 1 sec. to delete the selected message.

PLAYBACK/REC KEY
➥Push to playback the recorded messages in sequence, starting with the latest one.
- A short beep is emitted after playing back each message.
- A long beep is emitted after playing back all messages.
- "**NO REC**" is displayed when no message is in the memory.

➥Push and hold for 1 sec. to start recording. Push again to stop recording.
➥While playing back the message, push and hold for 1 sec. to delete the selected message.

MDC CALL KEY (MDC operation only)
➥ Push to enter the MDC menu selection mode. Then select the desired MDC menu from "SELCALL," "MSG," "STATUS," "RADIOCHK" and "CALALERT" using [CH Up]/[CH Down].
After selection, push this key again to enter the transceiver alias or message channel selection mode.
➥ While in the transceiver alias or message channel selection mode, push to return to the MDC menu selection mode.

MDC SELCALL KEY (MDC operation only)
Push to enter the transceiver alias selection mode.
- After the desired alias selection, push [PTT] to transmit a selective call.

MDC CALLALERT KEY (MDC operation only)
Push to enter the transceiver alias selection mode.
- After the desired alias selection, push [PTT] to transmit a call alert.

DIGITAL BUTTON KEY (BIIS operation only)
➥ Push to select the call ID list, transmit message and standby condition. Toggles between queue channel and received message record indication after queue channel is selected.
➥ Push and hold to select queue channel indication.

STATUS UP/DOWN KEYS (BIIS operation only)
➥ While in the standby condition, push to display the transmit status indication and select a status number.
➥ When a received SDM is displayed, push to cancel the automatic scroll and scroll the message manually.
➥ When an SDM that contains more than 8 characters is displayed, push to scroll the message manually.

Default setting for BIIS operation
The following functions are assigned to each programmable key as the default. However, the assigned function can be changed by your dealer.

[P0]; Call : Push to transmit a BIIS code when the selected channel is a MSK channel.
[P1]; Digital Button : Push to select the call list ID/transmit message, or push to display the receive message record for selection.
[P3]; Moni(Audi) : Push this key after the communication to send a 'clear down' signal during MSK channel operation.
[▼]/[▲]; CH Down/Up : While in the standby condition, push to select the operating channel.
After pushing [Digital] or [TX Code CH Select], push to select call list or TX code channel, respectively.
[P2]/[Red]; Null : No function is assigned.

➢ Turning power ON

① Rotate [VOL] to turn power ON.
- When the opening vibration function is turned ON, the transceiver vibrates for 2 sec. Ask your dealer for details.

② If the transceiver is programmed for a start up passcode, input digit codes as directed by your dealer.
- The keys in the table below can be used for password input:
- The transceiver detects numbers in the same block as identical.
  Therefore “01234” and “56789” are the same.

KEY	P0	P1	P2	P3	▼ or ▲
NUMBER	0 5	1 6	2 7	3 8	4 9

③ When the “PASSWORD” indication does not clear after inputting 4 digits, the input code number may be incorrect. Turn the power off and start over in this case.

➢ Channel selection

Several types of channel selections are available. Methods may differ according to your system set up.

NON-ZONE TYPE:

Push [CH Up]/[CH Down] to select the desired operating channel in sequence; or, push one of [MR-CH 1] to [MR-CH 4] to select a channel directly.

ZONE TYPE:

Push [Zone] then push [CH Up]/[CH Down] to select the desired zone.

AUTOMATIC SCAN TYPE:

Channel setting is not necessary for this type. When turning the power ON, the transceiver automatically starts scanning. Scanning stops when receiving a call.

➢ Call procedure

When your system employs tone signalling (excluding CTCSS and DTCS), this call procedure may be necessary prior to voice transmission. The tone signalling employed may be a selective calling system which allows you to call specific station(s) only and prevent unwanted stations from contacting you.

① Select the desired TX code channel or 2/5-tone code according to your System Operator’s instructions.
- This may not be necessary depending on programming.
- Refer to pgs. 18, 19 for selection.

② Push [Call] (assigned to one of the dealer programmable keys).

③ After transmitting, the remainder of your communication can be carried out in the normal fashion.

➢ Receiving and transmitting

NOTE: Transmitting without an antenna may damage the transceiver.
See p. 15 for antenna attachment.

Receiving:

① Rotate [VOL] to turn power ON.
② Push [CH Up] or [CH Down] to select a channel.
③ When receiving a call, adjust the audio output level to a comfortable listening level.

Transmitting:

Wait for the channel to become clear to avoid interference.

① While pushing and holding [PTT], speak into the microphone at a normal voice level.
- When a tone signalling system is used, the call procedure described at the previous page may be necessary.

② Release [PTT] to return to receive.

IMPORTANT: To maximize the readability of your signal;
1. Pause briefly after pushing [PTT].
2. Hold the microphone 5 to 10 cm (2 to 4 inches) from your mouth, then speak into the microphone at a normal voice level.

Receiving note

- **Vibration function** (Depends on the version)

When the matched RX code signal is received, the transceiver may vibrate for a specified time period, depending on the pre-setting.
Push any key or [PTT] to stop the vibration.

NOTE:
- The transceiver cannot stop the vibration suddenly after pushing any key or [PTT].
- The vibration sound may be heard at the communication party, or be recorded if the recording function is activated when [PTT] is pushed to stop the vibration.

Transmitting notes

- **Transmit inhibit function**

The transceiver has several inhibit functions which restrict transmission under the following conditions:
- The channel is in mute condition (‘Inaudible’ condition; “ ” does not appear).
- The channel is busy.
- Un-matched (or matched) CTCSS is received. (Depending on the pre-setting)
- The selected channel is a ‘receive only’ channel.

- **Time-out timer**

After continuous transmission for the pre-programmed time period, the time-out timer starts, causing the transceiver to stop transmitting.

• **Penalty timer**
Once the time-out timer starts, transmission is further inhibited for a period determined by the penalty timer.

TX code channel selection
If the transceiver has [TX Code CH Select] assigned to it, the indication can be toggled between the operating channel number (or name) and TX code channel number (or name). When the TX code channel number (or name) is displayed, [CH Up] or [CH Down] selects the TX code channel.

USING [TX CODE CH SELECT] KEY:
① Push [TX Code CH Select]— a TX code channel number (or name) appears.
② Push [CH Up] or [CH Down] to select the desired TX code channel.
③ After selecting, push [TX Code CH Select] to set.
• Return to the stand-by mode.
④ Push [Call] to transmit the selected TX code.

USING [TX CODE CH UP]/[TX CODE CH DOWN] KEY:
If the transceiver has a [TX Code CH Up] or [TX Code CH Down] key assignment, the programmed TX code channel can be selected directly when pushed.

TX code number edit (PMR operation only)
If the transceiver has [TX Code CH Select] or [TX Code Enter] assigned to it, TX code contents can be edited within the allowable digits.

USING [TX CODE CH SELECT] KEY:
① Push [TX Code CH Select] to enter the TX code channel selection mode.
• Select the desired operating channel before entering the TX code channel selection mode if necessary.
② Push [TX Code CH Select] for 1 sec. to enter the TX code edit mode.
• The digit to be edited blinks.
③ Push [TX Code CH Select] to select the desired digit to be edited.
④ Push [CH Up]/[CH Down] to select the desired digit.
⑤ Push [TX Code CH Select] to set. The digit to the right will blink automatically.
⑥ Repeat ④ and ⑤ to edit all allowable digits.
⑦ After editing, push [TX Code CH Select] to set.
• Return to the stand-by mode.
⑧Push [Call] to transmit.

USING [TX CODE ENTER] KEY:
① After pushing [TX Code CH Select], push [CH Up] or [CH Down], or push [TX Code CH Up] or [TX Code CH Down] to select the desired TX code channel.
② Push [TX Code Enter] to enter the TX code edit mode.
• The digit to be edited blinks.
③ Push [TX Code Enter] to select the desired digit to be edited.
④ Push [CH Up]/[CH Down] to select the desired digit.
⑤ Push [TX Code Enter] to set. The digit to the right will blink automatically.
⑥ Repeat ④ and ⑤ to edit all allowable digits.
⑦ After editing, push [TX Code Enter] to set.
• Return to the stand-by mode.
⑧ Push [Call] to transmit.

DTMF transmission
If the transceiver has [DTMF Autodial] assigned to it, the automatic DTMF transmission function is available. Up to 8 DTMF channels are available.

① Push [DTMF Autodial]— a DTMF channel appears.
② Push [CH Up] or [CH Down] to select the desired DTMF channel.
③ Push [DTMF Autodial] to transmit the DTMF code to the selected DTMF channel.

➢ **User set mode**
User set mode is accessed at power ON and allows you to set seldom-changed settings. You can "customize" the transceiver operation to suit your preferences and operating style.

Entering the user set mode:
① While pushing and holding [▼] and [▲], rotate [VOL] to power ON.
• Turn power OFF in advance.
• "**SET MODE**" appears for 1 sec.
② Push and hold [P0] for 1 sec. to enter user set mode.
③ Push [P0] momentarily to select the appropriate item.
Then push [▼] or [▲] to set the desired level/condition.
• Available set mode functions are **Backlight, Beep, SQL Level, Ringer Level, AF Min level, Mic Gain, VOX Gain*, VOX Delay*, Battery Voltage, Signal Moni, Vibration** and **Lone Worker.**
④ Push and hold [P0] again to exit set mode.
* Appears when the optional headset is connected.

User set mode is also available using a programmable key. Please refer to p. 28 [User Set Mode] section for instructions regarding using the key assigned for user set mode.

NOTE: [▼], [▲] and [P0] activate while in the user set mode regardless of the assigned key functions.

➢ Emergency transmission

When [Emergency] is pushed for the specified time period, an emergency signal is automatically transmitted.

When [Emergency] is pushed for the specified time period, the DTMF emergency signal is transmitted once or repeatedly on the emergency channel. However, when no emergency channel is specified, the signal is transmitted on the previously selected channel.

If you want to cancel the emergency call, push and hold the key again before transmitting the call.

➢ Scrambler function

The scrambler function provides private communication between stations with the same scrambler code.

① Push [Scrambler] to turn the scrambler function ON.
- " 8 " appears.

② Push [Scrambler] again to turn the scrambler function OFF.

➢ Stun function

When the specified ID, set as a kill key, is received, the stun function is activated.

When the kill ID is received, the transceiver switches to the password required condition. Entering of the password via the keypad is necessary to operate the transceiver again in this case.

➢ SQL Tight

The **SQL Tight Offset** is the function that prevents opening of the squelch from interference noise such as that generated by electronic devices.

The squelch tight function can be set ON or OFF for each memory channel.

When ON is selected, the noise squelch threshold level is determined in the following settings- **SQL Level** in the Set Mode screen and **SQL Tight Offset** in the Common screen.

When OFF is selected, the noise squelch threshold level is determined by **SQL Level** in the Set Mode screen only.

▪ SQL Level

Select the noise squelch threshold level from 0 to 9.

NOTE: The default setting level is 2. The noise squelch threshold level 0 is OPEN and 9 is CLOSE (The 2tightest" setting).

▪ SQL Tight Offset

Select the noise squelch threshold level from 0 to 9. This setting is used with **SQL Level** setting in Set Mode screen and Emergency-Setting screen when **SQL Tight** is turned "ON" in the Memory CH screen.

When the squelch tight function turned ON, the noise squelch threshold level works as a total number of the SQL Level and the SQL Tight Offset level. The maximum level will be 9 even if total number exceeds 9.

When turning the squelch tight function OFF, the noise squelch threshold level works based on the SQL Level.

NOTE: The default setting level is 9.

➢Recording function (Depends on the version)

The transceiver has a recording function that records the TX/RX voice messages. When the specified ID is received, the automatic recording function activates and records the voice message for a specified time period.
Or, if the transceiver has [Playback/Rec] assigned to it, manual recording is also available.
The maximum record length is 480 sec., and the number of recordable messages depend on the record length. Ask your dealer for details.
e.g. When the record length is 10 sec., 48 messages are recordable.

Automatic recording:

① When the specified ID is received, the recording function is automatically activated.
- " ✳ " blinks.

② While pushing and holding [PTT], speak into the microphone at a normal voice level.
- The TX voice message is recorded.

③ Release [PTT] to receive.
- The RX voice message is recorded.

④ The recording operation automatically stops after the following: the specified time has expired, the recording memory is full, pushing any key but [PTT], or transmitting a single tone.
- " ✳ " stops blinking.
- Pushing [Playback/Rec] (if assigned) also stops recording.

Manual recording:

① Push and hold [Playback/Rec] for 1 sec. to activate the recording function.
- " ✳ " blinks.

② While pushing and holding [PTT], speak into the microphone at a normal voice level.
- The TX voice message is recorded.

③ Release [PTT] to receive.
- The RX voice message is recorded.

④ Push [Playback/Rec] again to stop recording.
- " ✳ " stops blinking.
- The recording operation automatically stops after the following: the recording memory is full, pushing any key but [PTT], or transmitting a single tone.

Playing back:

The recorded voice messages are played back with [Playback] or [Playback/Rec].
- " ✳ " appears on the function display when the unplayed message is in the recording memory.

➥Push [Playback] or [Playback/Rec] to playback the recorded message in sequence starting with the latest one.
- Push [CH Up] or [CH Down] to select the desired message.
- A short beep is emitted after playing back each message.
- A long beep is emitted after playing back all messages.
- During playback mode, " ✳ " appears when the unplayed message is played back, or " ✳ " disappears when the played message is played back.
- " ✳ " disappears after playing back the unplayed message for the specified time period.

NOTE: You can transmit the recording message with [PTT] while playing back the message.

Deleting the message:

➥While playing back the message, push and hold [Playback] or [Playback/Rec] for 1 sec. to delete the message to be played back.

➥While pushing and holding [P0] and [CH Up], turn power ON to delete all messages in the recording memory.

3-2 Cloning Software CS-F50V
3-2-1 Basic Setup of Cloning Software

❑ Getting started

o This cloning software is designed to perform data setting and cloning for the IC-F50V series VHF TRANSCEIVERS.

o HELP WINDOW: CS-F50V has a help window to describe functions and operation.

❑ System requirements

To use this program, the following hardware and software are required:

PC

- Microsoft® Windows® 98/98SE/Me/2000/XP or Microsoft® Windows Vista™ is installed
- With RS-232C serial port (D-sub 9-pin) or USB port

Other items

- Optional OPC-966 CLONING CABLE (RS-232C type) or OPC-966U* CLONING CABLE (USB type)

NOTE:

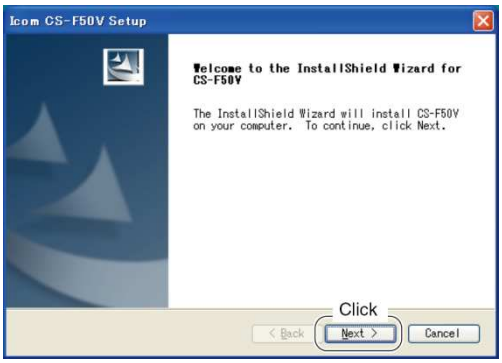
When using the OPC-966U*, USB type cloning cables, USB driver installation is necessary. The driver is supplied with the OPC-966U*. See the OPC-966U* instruction manual for the installation details.

*The USB driver, supplied with the OPC-966U, is not supported for Microsoft® Windows Vista™ (64bit).

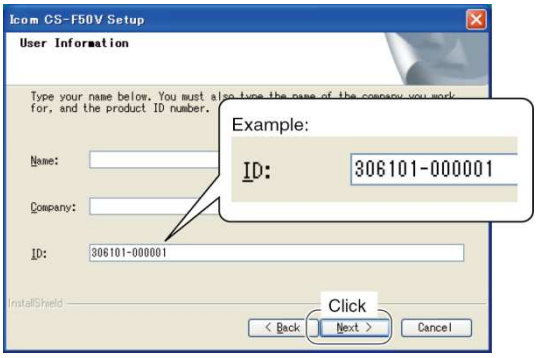
❑ Software installation

When installing into a Windows Vista™, Windows® XP or Windows® 2000 environment, log in as the **administrator.**

1. Quit all applications when Windows is running.
2. Insert the CD into the appropriate CD drive.
3. Double-click the “Setup.exe” contained in the CD.
4. The “Welcome to the InstallShield Wizard for CS-F50V” will appear as below. Click [Next>].


Icom CS-F50V Setup
Welcome to the InstallShield Wizard for CS-F50V
The InstallShield Wizard will install CS-F50V on your computer. To continue, click Next.
Click
< Back
Next >
Cancel

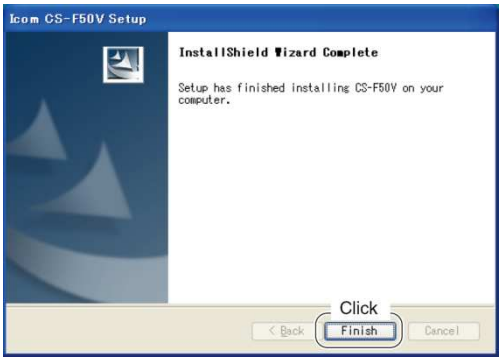
5. The “User Information” will appear as below, then type your name, your company name and the product ID number with the following manner. Then click [Next >].
   - ID number: 306101-(6 digit serial number)
   - e.g. the serial number on the CD is 000001, enter “306101-000001” as the ID number.



6. The “Choose Destination Location” will appear as below. Then click [Next>] to install the software to the destination folder. (e.g. C:\Program Files\Icom\CS-F50V)
   - Click [Browse...] to select another destination folder before clicking [Next >], if desired.

Icom CS-F50V Setup
Choose Destination Location
Select folder where setup will install files.
Setup will install CS-F50V in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Confirm
Destination Folder
C:\Program Files\Icom\CS-F50V
Click to select another destination folder.
Browse...
InstallShield
Click
< Back
Next >
Cancel

7. After the installation is completed, the “InstallShield Wizard Complete” will appear as below. Then click [Finish].



8. Eject the CD.
9. Program group ‘CS-F50V’ appears in the ‘Programs’ folder of the start menu, and ‘CS-F50V’ short cut icon appears on the desktop screen.
   - To uninstall the cloning software, select the “Control Panel” in the start menu, and click the “Add or Remove Programs.”
     Then, select the program group ‘CS-F50V’ and click [Change/Remove].

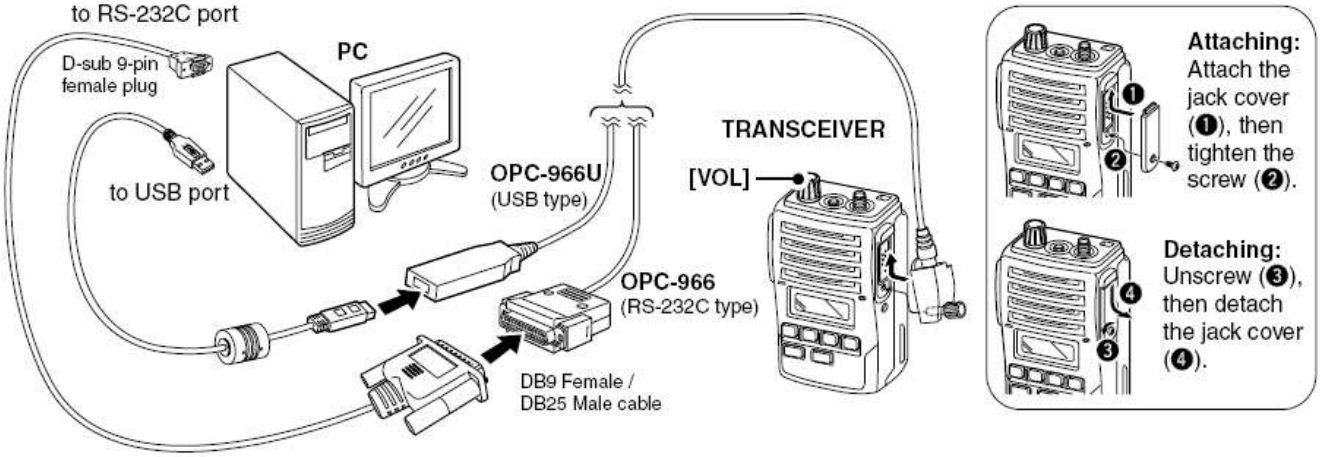
Note 1: Icom distributes cloning software by CD or license. Depending on this, some information here may not apply as written, e.g. ID number.

Basic Setup of Cloning Software

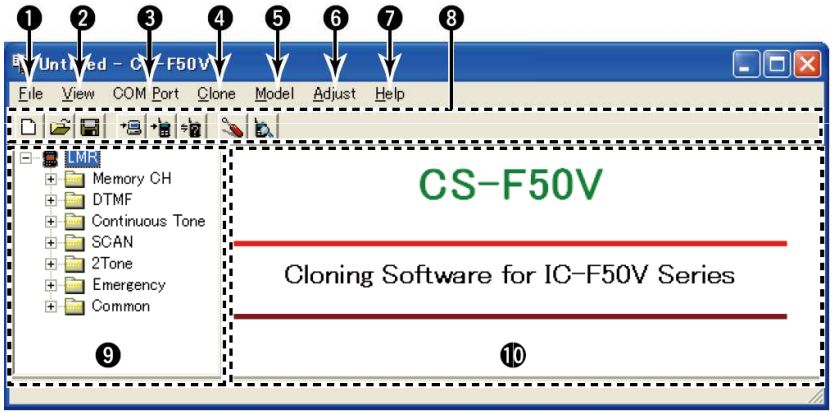
❑ Connections

All cloning operations are performed from the computer's keyboard— the operation required on the transceiver side is;

1. First, connect the cloning cable as illustrated below.
2. And then rotate [VOL] clockwise to turn power ON.


to RS-232C port
D-sub 9-pin female plug
PC
to USB port
OPC-966U (USB type)
TRANSCEIVER
[VOL]
OPC-966 (RS-232C type)
DB9 Female / DB25 Male cable
Attaching: Attach the jack cover (❶), then tighten the screw (❷).
Detaching: Unscrew (❸), then detach the jack cover (❹).

❑ Screen description



❶ FILE MENU [File]
Used for saving memory channel contents, printing the pre-programmed information or exiting the program, etc.

❷ VIEW MENU [View]
- Selects the displayed font size and language.
- Turn the tool bar indication ON or OFF.

❸ COM PORT MENU [COM Port]
- Click to display the COM port (1 to 4 and More) setting dialog box.
- Set the transfer speed (Normal or High).

NOTE: 'Check the following' dialog box appears when the COM port is not set correctly.

❹ CLONING MENU [Clone]
Click to display the cloning menu and cloning information dialog box.

❺ MODEL MENU [Model]
Select the appropriate model type which you are going to clone.

❻ ADJUST MENU [Adjust]
Click to display the adjust menu and the I/O Check dialog box.

NOTE: 'CAUTION' dialog box appears when selecting Read <- TR.

❼ HELP MENU [Help]
Click to display the help contents and cloning software revision information.

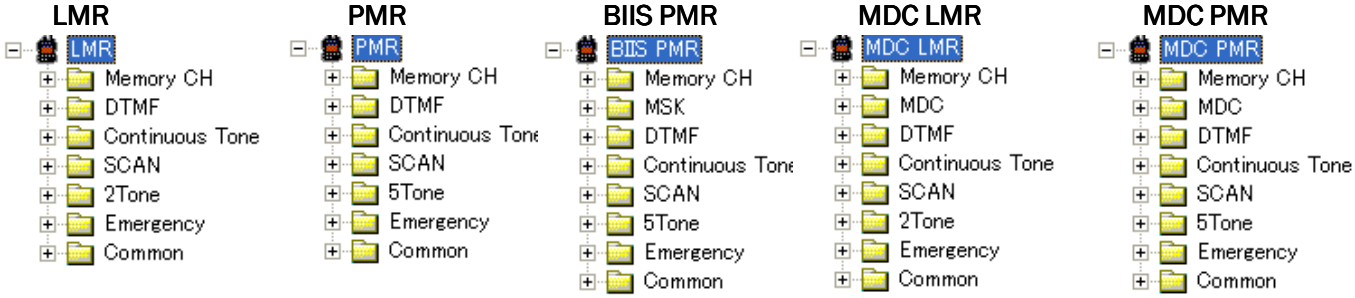
❽ TOOL BAR
Shortcut buttons appear on the tool bar when the tool bar indication is turned ON in the [View] menu.

❾ TREE VIEW SCREEN
Click the folder icon which you want to edit.

❿ CONTENTS LIST SCREEN
Display the contents list.

❑ Programming information

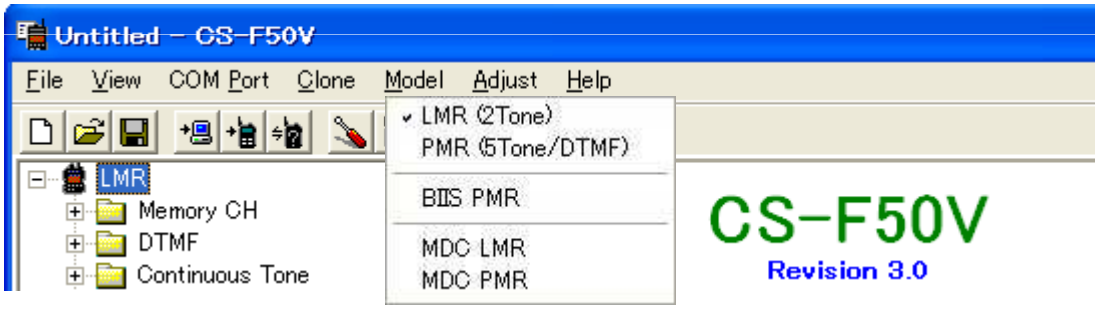
- We recommend that you should read out all the transceiver's data before start entering/editing parameters even if the transceiver is factory fresh. This avoids rare glitches which might cause programming errors when writing back the altered parameters.
- CS-F50V has 5 model types. You can select the desired model type which you are going to clone. LMR (2Tone), PMR (5Tone/DTMF), BIIS PMR, MDC LMR or MDC PMR is available. The Tree View screen content will be changed when the model type is switched.



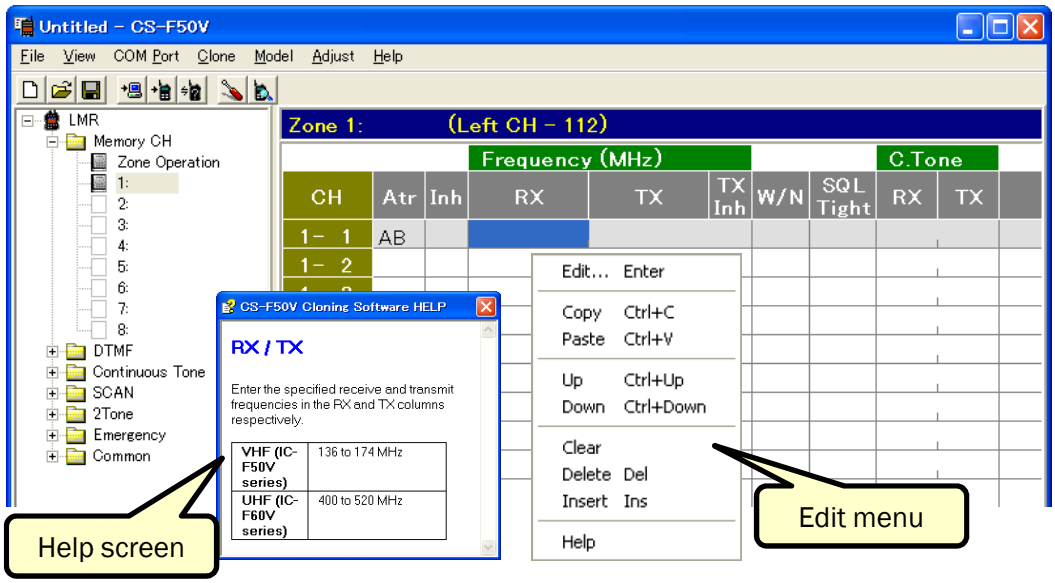
- Select the model type which you are going to clone from; LMR (2Tone), PMR (5Tone/DTMF), BIIS PMR, MDC LMR and MDC PMR.

  LMR : Land Mobile Radio. 2-Tone and MDC are available.
  PMR : Private Mobile Radio. 5-Tone and MDC functions are available.
  BIIS PMR : Binary Interchange of Information and Signaling. MSK and 5-Tone functions are available.

☞NOTE:
The model type must be selected at first, otherwise the edited contents will be lost.



- Double-click the desired cell in the contents list screen directory, or right-click the cell then click **[Edit... Enter]** to select and change the setting depends on the item.
- Click **[Help] to display the help screen** for the item.



3-2-2 Cloning Items

❑ Cloning items

The **Memory CH, MSK, MDC, DTMF, Continuous Tone, SCAN, 2-Tone, 5-Tone, Emergency** and **Common** items allow you to set the transceiver customized.

Memory CH

Set the number of channels and the zone usage for each zone, and channel attribute, operating frequency, CTCSS encoder/decoder frequency, transmit output power, voice scrambling code, etc.
A total of 128 memory channels are available and are separated into 8 zones. The zone condition setting screen appears in the Contents List screen by clicking the Zone Operation icon.
The only programmable zone icons appear and the memory channels condition in the zone is displayed in the Contents List screen.

MSK (Available only when BIIS PMR model is selected.)

Set the ID range, IDs, messages for status and SDM, MSK operating condition, etc.
By clicking the ID Range, Own ID/Group, Call List, Status, SDM, Timing & Error or Config. icon, the setting items appear in the Contents List screen, respectively.

MDC (Available only when MDC LMR or MDC PMR model is selected.)

This window defines the global settings for each of the five individual MDC systems within the radio. The system window lists all of the MDC features for the radio.
By clicking the System, General, PTTID, Emg, SelCall, Call Alert, Radio Check, Stun, Revive, Status, Message, Alias icon, the setting items appear in the Contents List screen, respectively.

DTMF

Program DTMF autodial code, emergency code*1 and Log/ID code*1 for the DTMF code transmission. Then set timers for each digit, 1st digit, [*] and [#] code.
By clicking the DTMF Autodial or the DTMF Setting icon, the setting items appear in the Contents List screen, respectively.
*1Available when LMR model is selected.

Continuous Tone

Set the continuous tone frequency. The programmed continuous tone is used for encoder and/or decoder.
By clicking the Continuous Tone or the Continuous Tone Setting icon, the setting items appear in the Contents List screen, respectively.

SCAN

Set scan mode, text for each scan group, power save function scan stop/resume timers, etc.
By clicking the Scan List or Scan Setting icon, the setting items appear in the Contents List screen, respectively.

2-Tone

Set the code channel details such as 1st/2nd frequency, text, beep, bell, stun, group call, ANS functions.
By clicking the Code CH or RX Code Setting icon, the setting items appear in the Contents List screen, respectively.

5-Tone

Sets RX/TX code, text, 5-Tone format, beep, bell, stun, group call, answer back functions, etc.
By clicking the RX/TX Code CH, RX/TX Code Setting, Format or User Tone icon, the setting items appear in the Contents List screen, respectively.

Emergency

Sets text, alert level, SQL level, Mic gain, repeat cycle, silent functions, emergency timer, lone worker timer, signaling etc.
By clicking the Emergency Setting icon, the setting items appear in the Contents List screen, respectively.

Common

Sets programmable function keys, function display assign and several commonly used timers, etc., are programmable.
By clicking the Key & Display, Set Mode, Common or Character Editor icon, the setting items appear in the Contents List screen, respectively.

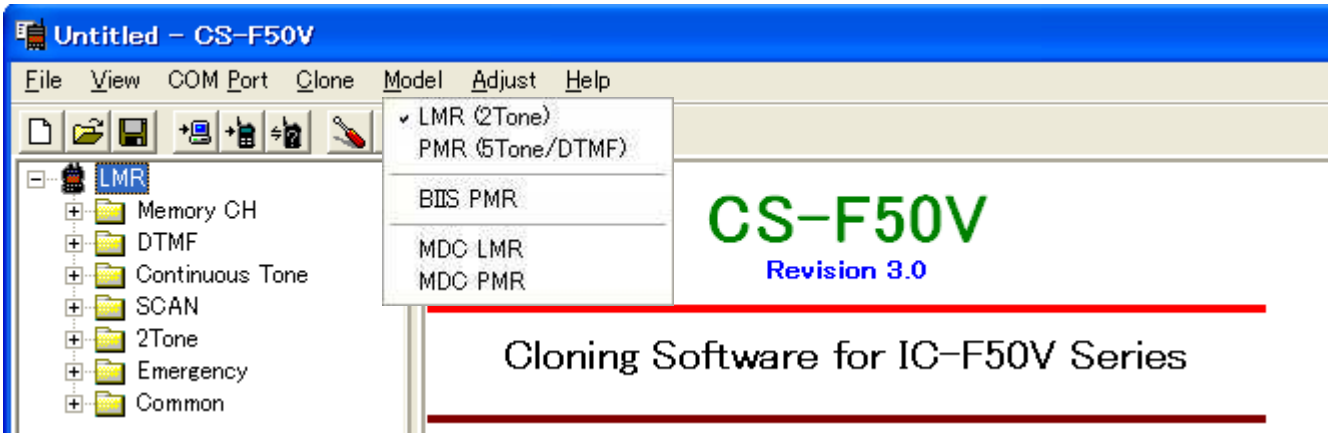
❑ Adjust Utility

You can program the adjustment frequencies in the Memory CH screen.

NOTE:
BACK UP the originally programmed memory data in the transceiver before programming the adjustment frequencies.
When programming the adjustment frequencies into the transceiver, the transceiver's memory data will be overwritten and lose original memory data at the same time.

NOTE: The above instructions are for reference only. Please refer to the HELP file of the cloning software for the function or setting details.

3-3 2-Tone (LMR) Signalling



What is 2-Tone Signalling?

1. Originally called "Quick Call", this signalling protocol was developed by Motorola in the 1950's.
2. 2-Tone (Quick Call) was designed to add Squelch specificity especially for emergency service radios.
3. LMR consists of two distinct signals sent over the air to a radio or a group.
4. Each tone can be configured within a 250 Hz and 3300 Hz tone frequency.
5. Normally, the duration of the tones varies from one (1) to three (3) seconds in length no space between the tones. Tone lengths of up to 10 seconds are commonly seen in existing applications.
6. ICOM radios allow variable tone periods and spaces (no tone) between the tones.

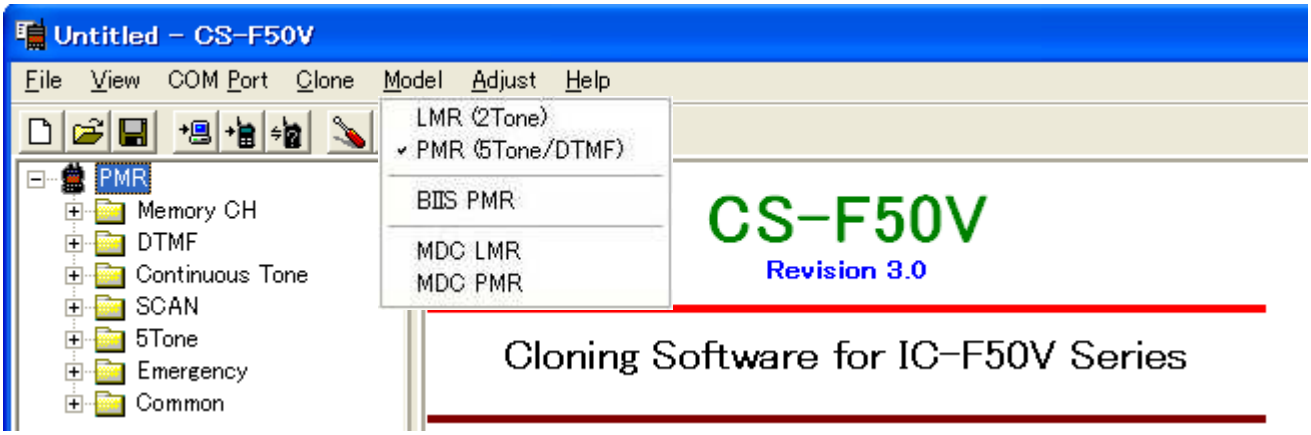
2-Tone Features

1. "Selective Calling" – allows the dispatch console to page an individual unit. Early models only allowed 1 (one) encoding tone set per channel or up to 3 (three) receive tones in the radio. Newer ICOM radios allows the programming of up to 10 (ten) tones that can be used all in one channel if necessary.
2. "Group Calling" - allows the dispatch console to page a group.
3. "Answer Back Call" – Also known as "Radio Check" allows the dispatch console or another portable, to send a tone to a particular radio and when the target radio receives the tone it answers back with another tone. This function serves as a tool to verify if a unit is "ON" and within range.
4. "Auto Transmit" – Also known as "Radio Spy" allows the dispatcher to send a 2-Tone signal to the radio causing it to open its transmitter microphone audio (Hot Mic) in order to listen to whatever is happening in the proximity of the radio. This is also very useful in emergency cases where the user may not be able to trigger the microphone.
5. "Stun/Kill – This function allows the dispatch console to disable, temporarily or permanently, a unit using the 2-Tone capabilities. When "Stun" is used, the unit may regain its functionality by entering a password. When Kill is used, the radio only regains functionality by reprogramming the unit using the cloning software.
6. "Scan Start/Cancel" – Using 2-Tone a dispatcher can send a signal to a radio or a group to commence the "Scan" function of the radio. If used with a group of users, this feature allows the dispatcher to regroup everyone in a different, but common channel. This feature is also known as "Radio Regroup".

ICOM 2-Tone Radio Enhancements include:

1. RX Code Text – Allows the programmer to add an "Alpha Numeric" text tag to each tone for identification at decode and encode if the unit has a display.
2. Variable Signals – This allows the user/programmer to set the "Beep and Bell" to different formats for easier identification when a signal is received.
3. Tones Assignable on a Channel by Channel Basis – The newer Icom radios allow the programmer to enter in ten (10) tone sets, which can be used for both encode AND decode if necessary. Each channel has the capability to use all tones for both encode and decode, if programmed correctly.
4. Multiple Tone Sets per Channel – This also allows the programmer to set all ten (10) tones on a single channel if it was deemed necessary. Each channel allows a programmer to use a combination of tones per channel as needed.

3-4 5-Tone (PMR) Signalling



What is 5-Tone Signalling?

1. Although it is dubbed as 5-Tone, this signalling protocol consists of a fast data burst of one (1) to seven (7) frequency tones that can selectively signal a radio.
2. Originally a European signalling protocol, 5-Tone has numerous formats such as:
    a. CCIR
    b. ZVEI1
    c. ZVEI2
    d. DZV1
    e. EEA
    f. EEA2
    g. DAPL
    h. EIA
    i. DTMF (Dual Tone Multi Frequency) *Check model for availability.
3. EIA is the International Open Standard set by the Electronics Industries Association.
4. 5-Tone adds specificity to the squelch abilities of commercial radios.

Where to activate 5-Tone

1. Enable the radio in PMR mode by selecting the PMR Model in the Model section of the cloning software.
2. To create the 5-Tone TX list, click on the 5-Tone folder and select the “TX Code CH” icon.
3. In this section the user can create up to 32 encode able tone sequences.
4. Each of these tone sequences can be identified with an alias on the list.

5-Tone Format Structure

1. Unlike 2-Tone, where the programmer must know the frequency to be used on each tone, 5-Tone does not require knowledge of the frequencies to be used.
2. Each digit in the sequence is already predefined with a specific frequency depending on the format selected in the Tone form section of the programming.
3. All the programmer needs to know is what format is being used and what code needs to do what. The system does the rest.
4. If there was a need, although it is not highly recommended, the tone formats can be modified to specific needs.
5. The 5-Tone Format section of programming allows the programmer to view and modify three (3) aspects of the 5-Tone format.
6. Tone Period - is the length of the encoded tone.
7. Notone Timer – is the space required between tones for proper decoding (tone spread).
8. Tone Length – is the time the radio takes to decode a tone.

*** **Re-emphasize**: ICOM strongly recommends that programmers do NOT alter any data in the Format screen

5-Tone (PMR) Signalling

Why chose 5-Tone?

1. 5-Tone is a non-proprietary signalling protocol that allows the Icom radio to inter-operate with other brands using the 5-Tone signalling.
2. This protocol also allows a mixed fleet operation.
3. It is faster than 2-Tone by employing a quick data burst.
4. Customers are familiar with the protocol since it is an Industry Standard in USA, Europe, and Asia.
5. Many manufacturers built dispatch consoles with this capability.
6. 5-Tone offers flexible muting characteristics.

5-Tone Features

1. Selective Calling" – allows the dispatch console to page an individual unit.
2. "Group Calling" - allows the dispatch console to page a group.
3. "Answer Back Call" – Also known as "Radio Check" allows the dispatch console to send a 5-Tone sequence to a particular radio and when the target radio receives the tone it answers back with another tone. This function serves as a tool to verify if a unit is "ON" and within range.
4. "Auto Transmit" – Also known as "Radio Spy" allows the dispatcher to send a 5-Tone signal to the radio causing it to open its transmitter microphone audio (Hot Mic) in order to listen to whatever is happening in the proximity of the radio. This is also very useful in emergency cases where the user may not be able to trigger the microphone.
5. "Stun/Kill – This function allows the dispatch console to disable temporarily or permanently a unit using the 5-Tone capabilities. When "Stun" is used, the unit may regain its functionality by entering a password. When Kill is used, the radio only regains functionality by reprogramming the unit using the cloning software.
6. "Scan Start/Cancel" – Using 5-Tone a dispatcher can send a signal to a radio or a group to commence the "Scan" function of the radio. If used with a group of users, this feature allows the dispatcher to regroup everyone in a different channel. This feature is also known as "Radio Regroup".
7. 5-Tone allows the PTT ID functionality on the radio.
8. As with 2-Tone, PMR also provides audible alerts, emergency signalling and Dispatch functionality making it a workable upgrade to an existing fleet.

***All these functions can be accomplished with individual radios also.

5-Tone Enhancements

1. The PMR model and radio functionality provides the programmer with RX Text identifiers. When a particular 5-Tone sequence is received, a radio with display will show the alias attributed to that tone sequence.
2. Where applicable, this radio also has flashing indicators, variable audible signals and beeps.
3. When transmitting a 5-Tone sequence, the radio can select from a programmed list with aliases in order to identify the code desired for TX.
4. PMR radios allow for TX code editing and the creation of a custom "User Code" that will allow the programmer to create a unique code for a customer.
5. The system also allows for a user to select the TX codes by assigning a button on the radio.

Scan List

A total of 17 scanning lists are available for a wide variety and flexible scanning operation. In this screen, program scanning condition for each list.
The Scan list "Zone" set channel is scanned when it is being included in the same zone with the scan start channel.

➢Scan Type

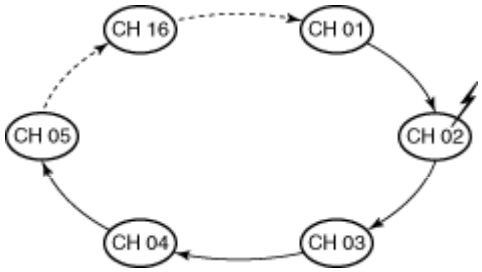
Set the scanning type to each scan list. Scan OFF, Vote, Normal Scan and Priority Scan are available. The watch time period, the power ON scan function etc. are programmed in Scan Setting screen.

Scan OFF:

Scanning operation is turned OFF.

Normal Scan:

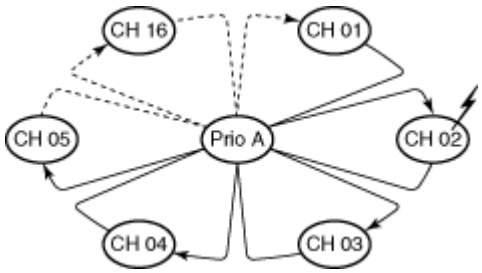
Normal scan. Scans all selected channels. The scan proceeds in sequence.



Priority Scan:

Priority scan. "Primary CH" and "Secondary CH" are used as the priority channel.
The selected channels are scanned in sequence while monitoring "Primary CH" and "Secondary CH.“
When scan is paused on "Primary CH," other channels are not monitored.

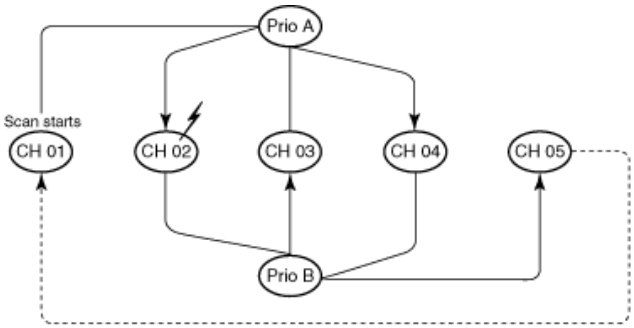
When "Secondary CH" is not set:



When a signal is detected on a channel other than "Primary CH," scan pauses until the signal disappears and "Primary CH" is continuously monitored.

Scan moves and pauses on "Primary CH," if the signal is detected on.

When "Secondary CH" is set:



– When a signal is detected on a channel other than "Primary CH" or "Secondary CH," scan pauses until the signal disappears and "Primary CH" and "Secondary CH" are continuously monitored alternately.
Scan moves and pauses on "Primary CH" or "Secondary CH" if a signal is detected on.
– When a signal is detected on "Secondary CH," scan pauses until the signal disappears and "Primary CH" is continuously monitored.
Scan moves and pauses on "Primary CH" if a signal is detected.

*"Prio A" means "Primary CH," and "Prio B" means "Secondary CH.“

NOTE:
The scanning channels are selected in Scan List in the Memory CH screen.

The compatibility of the previous and current scan modes

The previous scan mode		The current scan mode						
		Scan type	Primary CH	Secondary CH	TX CH	Talk Back	TX action	Cancel CH
Scan OFF		Scan OFF	-	-	-	-	-	-
Mode1	Normal	Normal	-	-	Last CH	-	Cancel	TX CH
Mode1	R.SelA	Normal	-	-	Start CH	ON	Pause	Start CH
Mode2	Prio-A	Priority	Prio-A	-	Prio-A	ON	Cancel	TXCH/TB
Mode2	Prio-A,B	Priority	Prio-A	Prio-B	Prio-A	ON	Cancel	TXCH/TB
Mode2	R.Sel	Priority	Start CH	-	Start CH	ON	Cancel	TXCH/TB
Mode2	R.SelA	Priority	Start CH	-	Start CH	ON	Pause	Start CH
Mode3	Prio-A	Priority	Prio-A	-	Prio-A	OFF	Cancel	TX CH
Mode3	Prio-A,B	Priority	Prio-A	Prio-B	Prio-A	OFF	Cancel	TX CH
Mode3	R.Sel	Priority	Start CH	-	Start CH	OFF	Cancel	TX CH
Mode3	R.SelA	Priority	Start CH	-	Start CH	OFF	Pause	Start CH

➢ **Primary CH** (Available when "Priority Scan" is selected in **Scan Type**.)
Select the desired channel as a primary channel. The selected channel is monitored during priority scan.

Prio-A CH : The priority A channel is used as the primary channel.
Prio-B CH : The priority B channel is used as the primary channel.
Start CH : Scan start channel is used as the primary channel.
CH Number Select : The selected channel is used as the primary channel.

➢ **Secondary CH** (Available when "Priority Scan" is selected in **Scan Type**.)
Select the desired channel as a secondary channel. The selected channel is monitored during priority scan. The secondary channel is lower priority than primary channel.

Disable : The secondary channel is not used.
Prio-A CH : The priority A channel is used as the secondary channel.
Prio-B CH : The priority B channel is used as the secondary channel.
Start CH : Scan start channel is used as the secondary channel.
CH Number Select : The selected channel is used as the secondary channel.

➢ **TX CH** (Available when "Normal Scan" or "Priority Scan" is selected in **Scan Type**.)
Select the desired channel as a transmission channel.

Last CH : Transmission is performed in the last busy channel. If it is no busy channel, the scan start channel is selected for transmission.
Prio-A CH : Transmission is performed in the priority A channel.
Prio-B CH : Transmission is performed in the priority B channel.
Start CH : Transmission is performed in the scan start channel.
CH Number Select : Transmission is performed in the selected channel.

➢ **Talk Back** (Available when "Normal Scan" or "Priority Scan" is selected in **Scan Type**.)
Select the talk back function ON or OFF.
If "Last CH" is selected in **TX CH**, this function is not available.

ON : When transmission is performed within the talk back timer (after the resume timer has passed), the signal is transmitted in the last busy channel.
OFF : Even if transmission is performed within the talk back timer* (after the resume timer has passed), the signal is transmitted in the channel that is selected in **TX CH**.

*Talk back timer is set in **Talk Back (Sec)** in Scan Setting screen.

➢ **TX Action** (Available when "Normal Scan" or "Priority Scan" is selected in **Scan Type**.)
Select the transmission action when transmission is performed during scanning.

Cancel Scan : Scan is cancelled and transmission is performed in the channel that is selected in **TX CH**.
If Talk Back is turned ON and transmission is performed within the talk back timer, the signal is transmitted in the last busy channel.
Pause Scan : Scan is paused until the signal disappears and then resumes after the resume timer* has passed.

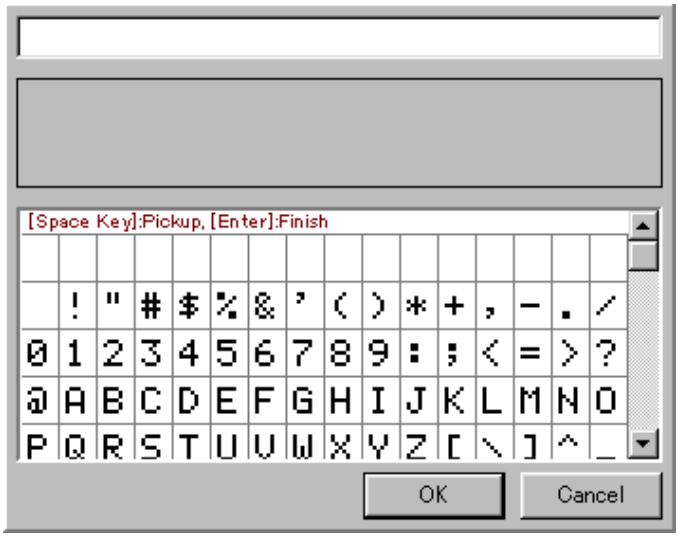
* Resume timer is set in Resume (Sec) in Scan Setting screen.

➢ **Cancel CH** (Available when "Normal Scan" or "Priority Scan" is selected in **Scan Type**.)
Select the desired channel type that is selected when scan is cancelled (except for transmission.)

Start CH : The scan start channel is selected automatically.
Start CH/Talk Back : The scan start channel is selected automatically when scan is cancelled during scanning.
The last busy channel is selected automatically when scan is cancelled while receiving a signal, or during scanning within the talk back timer (after the resume timer has passed).
TX CH : The channel that is selected in **TX CH** is selected automatically.
TX CH/Talk Back : The channel that is selected in **TX CH** is selected automatically when scan is cancelled during scanning.
The last busy channel is selected automatically when scan is cancelled while receiving a signal, or during scanning within the talk back timer (after the resume timer has passed).

➢ Display Text

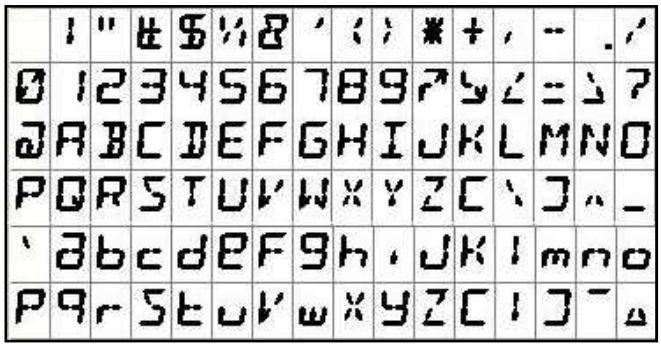
Enter up to an 8-character text to indicate message, etc. and/or indicating the scan list during scanning.



Right click to display the [Edit... Enter] menu and click [Edit... Enter].

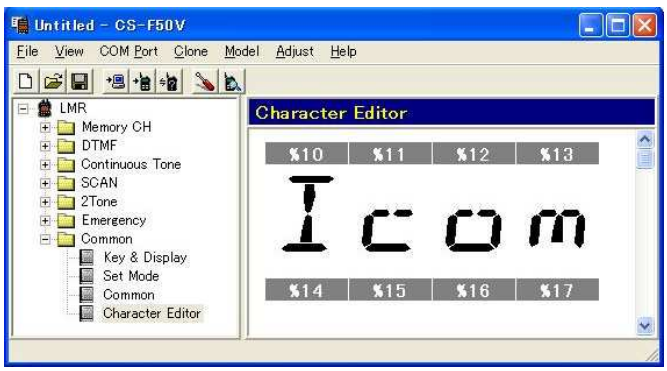
– Double click the desired character in the table or push [Space] to pick up the character.
– Push [Enter] to finish editing.

Usable characters are listed below.



➢ Character Editor

- You can use and make an original character that is edited in the Character Editor Screen.



Edit the original character

Up to 16 original characters or symbols can be edited/created in this sheet for a variety of information indication.

1. Right click to display the Edit menu.
2. Left click [Edit... Enter] then the Character Editor screen appears. Edit the segments with Left click on the desired segment.

   Left click the segment to change the segment color black and white.

   * Right click to display the [Edit... Enter] menu and select Copy, Paste, Up and Down.
   * Double clicking the desired thumbnail (%10 to %1F) in the screen also enters the Character Editor screen.

➢ Text

Select the text indication capability from OFF, Text or Start CH during scan.

OFF : The text indication is turned OFF.
Text : The text indication is turned ON. The channel's text that is programmed in Display Text as above is indicated during scan.
Start CH : The text indication is turned ON. The scan start channel's text is indicated during scan.

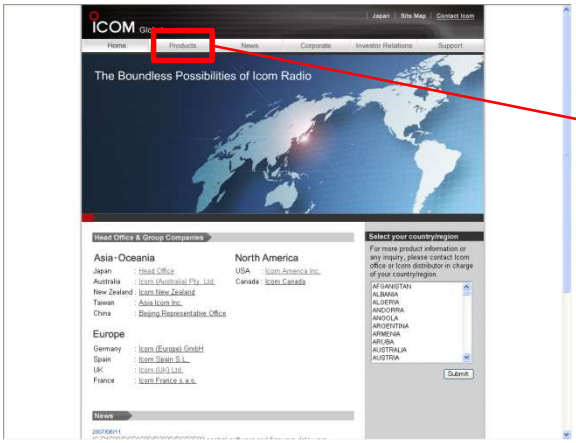
➢ PWR Save

Turn the power save function ON and OFF during scan. Total scanning speed is decreased when the function is activated.

A-1 Promotional Materials

➢ The following Catalogues are available on the Icom web site.
URL: http://www.icom.co.jp/world/index.html

< Home Page >



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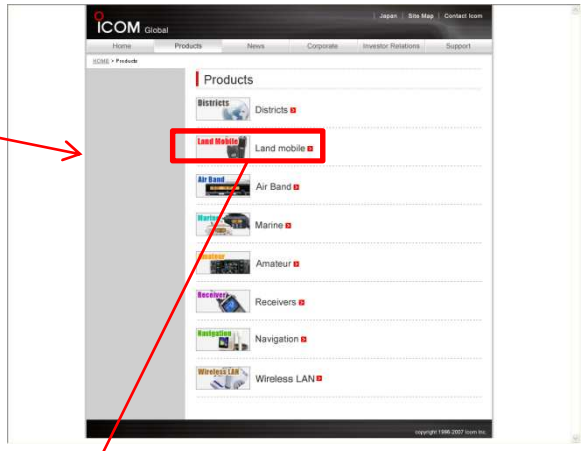
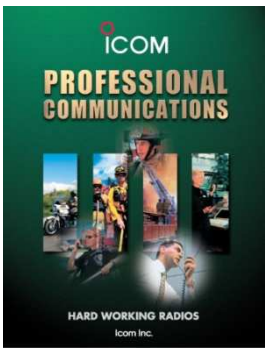


IC-F50V

➢ The following Materials are available upon request through local Icom Distributors in your region.



LMR
Full line brochure

LMR Poster

➢ The following Instruction Manuals are available on the Icom web site.
URL: http://www.icom.co.jp/world/index.html

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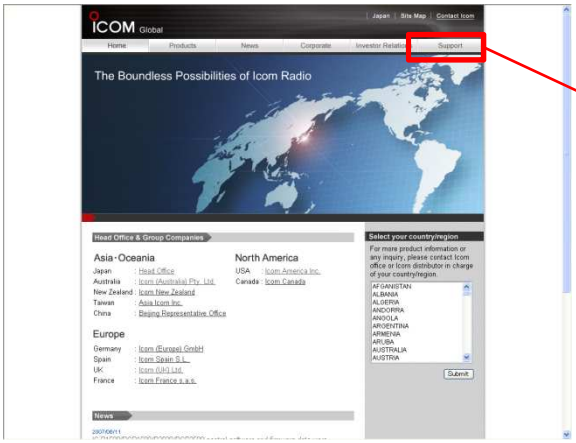

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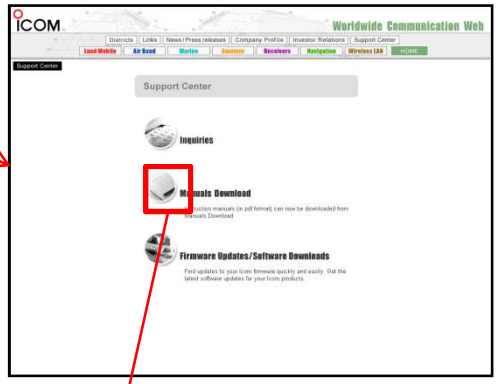

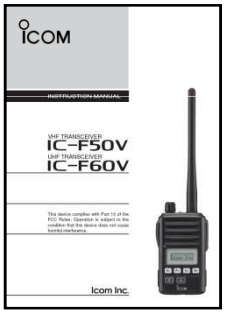

INSTRUCTION MANUAL
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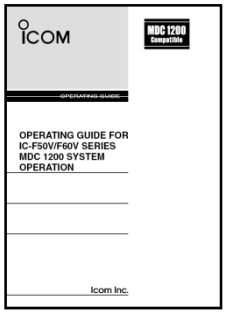
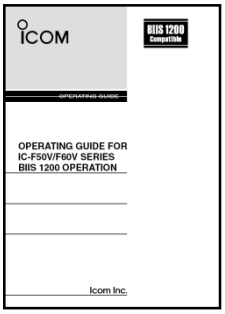


OPERATING GUIDE FOR IC-F50V/F60V SERIES MDC 1200 SYSTEM OPERATION



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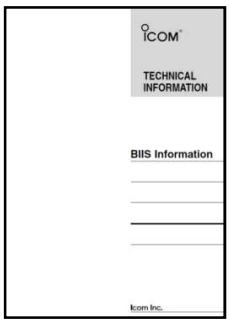

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